VOLUME XLVII NUMBER THREE

THE NATIONAL GEOGRAPHIC MAGAZINE

MARCH, 1925

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TO carry out the purposes for which it was founded thirty-seven years ago, the National Geographic Society publishes this Magazine. All receipts are invested in the Magazine itself or expended directly to promote geographic knowledge.

ARTICLES and photographs are desired. For material which the Magazine can use, generous remuneration is made. Contributions should be accompanied by an addressed return envelope and postage.

IMMEDIATELY after the terrific eruption of the world's largest crater, Mt. Katmai, in Alaska, a National Geographic Society expedition was sent to make observations of this remarkable phenomenon. Four expeditions have followed and the extraordinary scientific data resulting given to the world. In this vicinity an eighth wonder of the world was discovered and explored—"The Valley of Ten Thousand Smokes," a vast area of steaming, spouting fissures. As a result of The Society's discoveries this area has been created a National Monument by proclamation of the President of the United States.

AT an expense of over $50,000 The Society sent a notable series of expeditions into Peru to investigate the traces of the Inca race. Their discoveries form a large share of our knowledge of a civilization waning when Pizarro first set foot in Peru.

THE Society also had the honor of subscribing a substantial sum to the expedition of Admiral Peary, who discovered the North Pole.

NOT long ago The Society granted $25,000, and in addition $75,000 was given by individual members to the Government when the congressional appropriation for the purpose was insufficient, and the finest of the giant sequoia trees of California were thereby saved for the American people.

THE Society is conducting extensive explorations and excavations in northwestern New Mexico, which was one of the most densely populated areas in North America before Columbus came, a region where prehistoric peoples lived in vast communal dwellings and whose customs, ceremonies, and name have been engulfed in an oblivion.

THE Society also is maintaining expeditions in the unknown area adjacent to the San Juan River in southeastern Utah, and in Yunnan, Kweichow, and Kansu, China—all regions virgin to scientific study.

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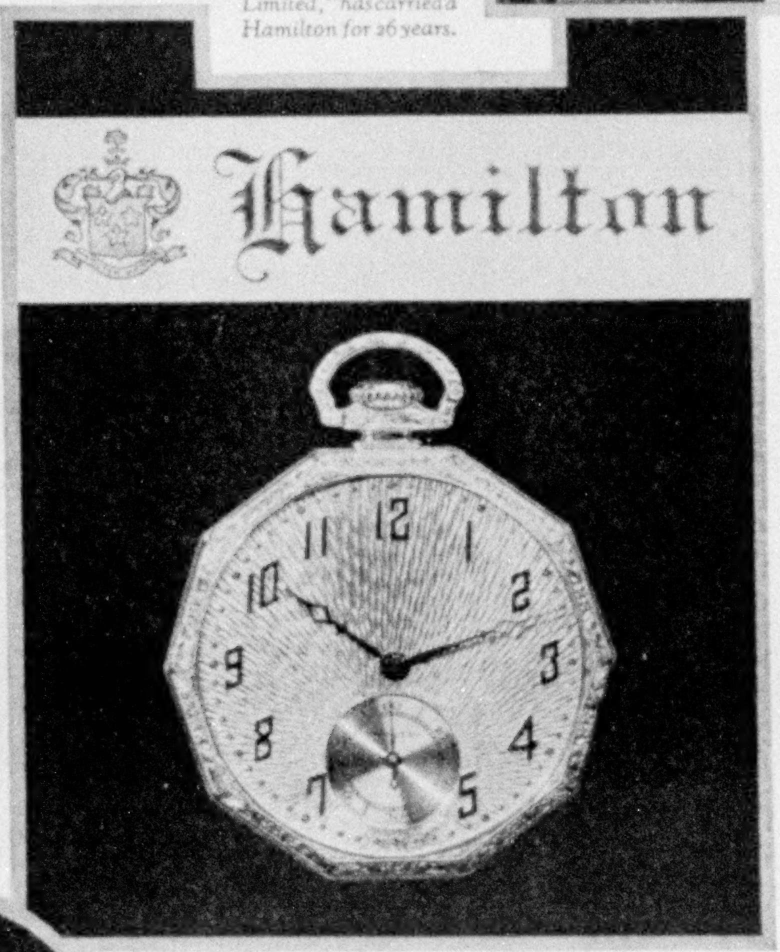

"WHAT TIME HAVE YOU?" Ask this question of a group of business men. Out come their watches. One watch is three minutes slow, another five minutes fast, and so on. But ask this question of a group of railroad men. If there is any variation it is usually only a matter of seconds. Yet it is so very easy for every business and professional man to have a watch as unfailingly accurate as the railroad man's. When you buy a watch get the make he uses. For thirty years there has been *one* watch that has been generally favored on America's railroads, a watch that has earned the unique distinction of being called "The railroad timekeeper of America." This watch of accuracy fame is the Hamilton. It rides in cab and coach of such famous fliers as the Twentieth Century, the California Limited, the Broadway Limited and the Olympian. When you buy a Hamilton, accuracy is assured.

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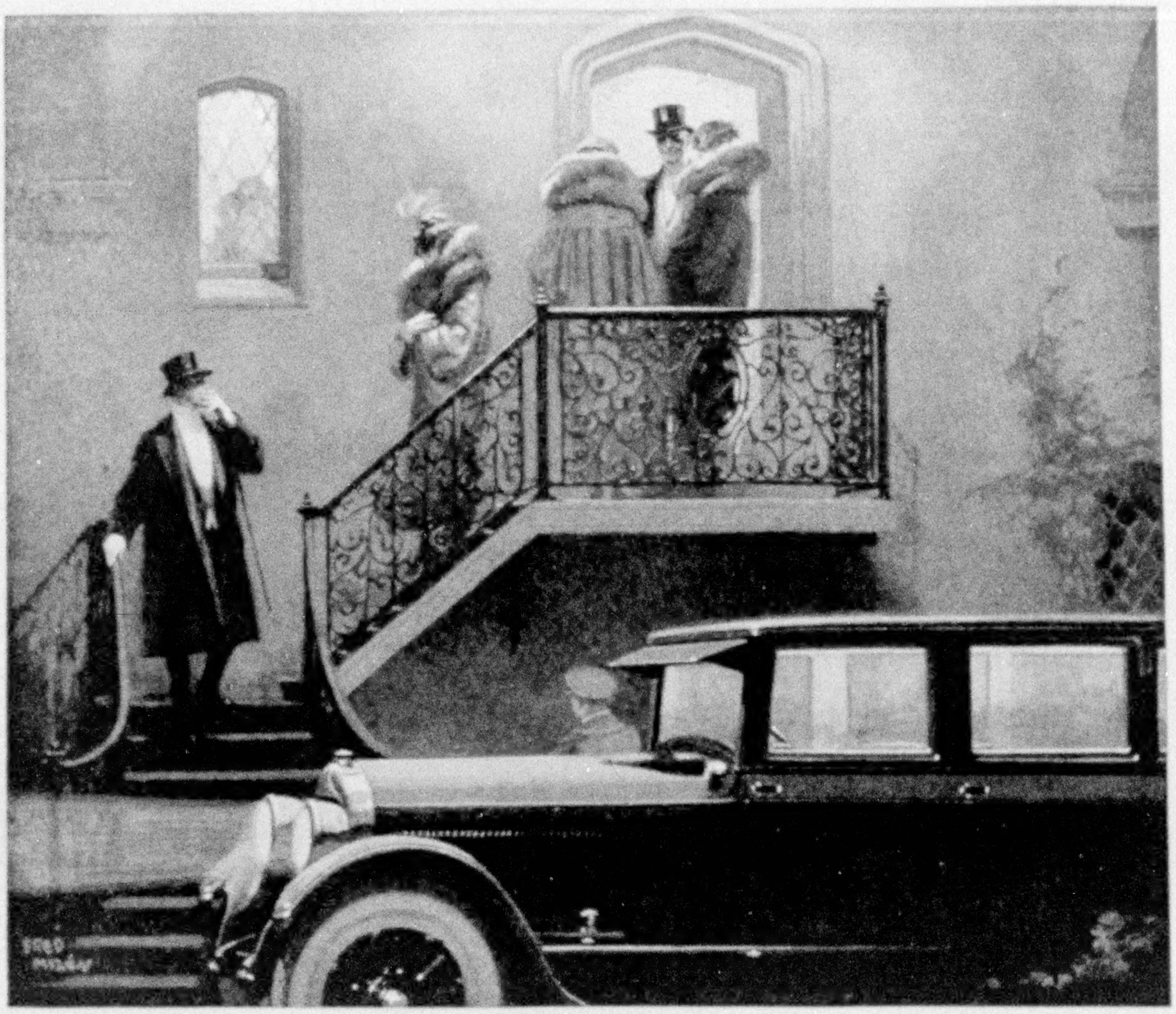

V63

V63

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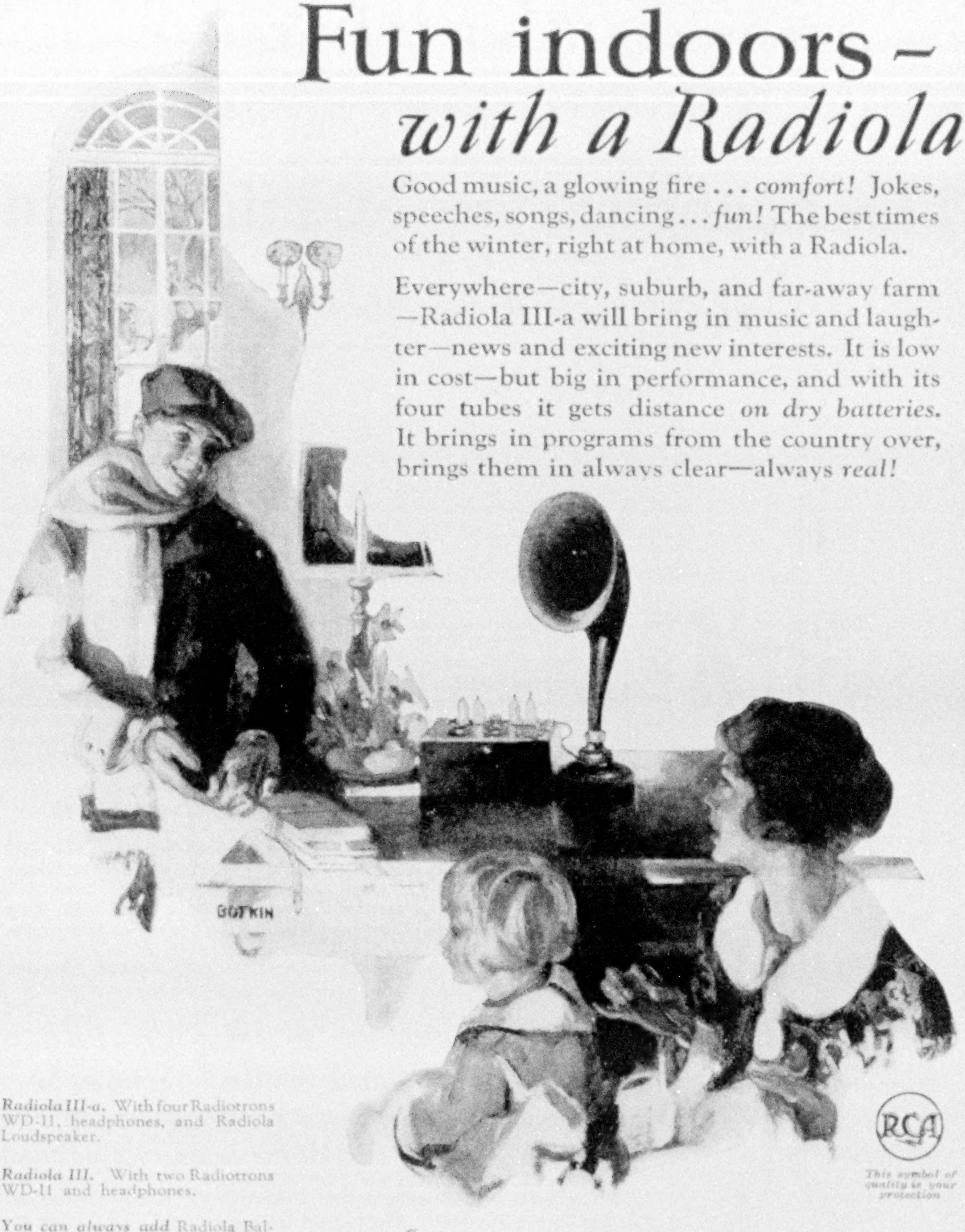

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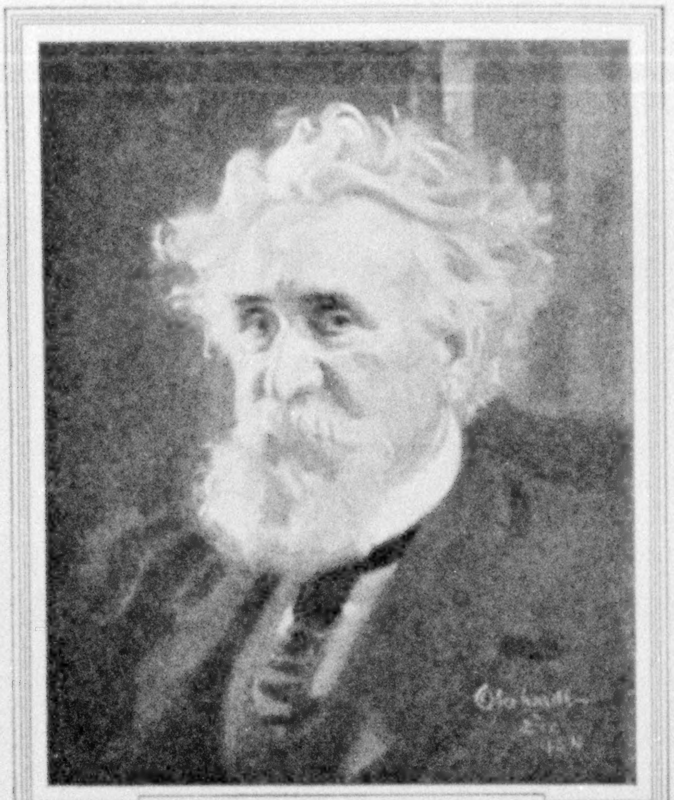

HUDSON MAXIM

When robbed of my Elgin I lost a friend that had to be replaced . . . by another Elgin

One of a series of little biographies of Elgin Watches.

. . . . WRITTEN BY EMINENT ELGINEERS

A watch is an indispensable part of me, but the one watch—the watch of watches—the best watch ever—an Elgin in a hunter case—was purchased by me just after I had sold the secret of the high explosive Maximite to the United States Government in 1901.

On the crystal, right between me and the time of day, I had photographed the face of my wife as she was when I first met her—the loveliest face in all the world, which has since haloed all my hours.

I carried this watch for about five years, when one day, in a crowded trolley car, during a savage February blizzard, some light-fingered fellow working that crowd took my watch, and when I next looked for the time, I found I had only the end of the chain.

Well, I bought another Elgin, restored the photograph, and thus far I have avoided losing it to the light-fingered gentry.

I like a good time. Time is my keeper, so I like a good time-keeper.

—*by* HUDSON MAXIM

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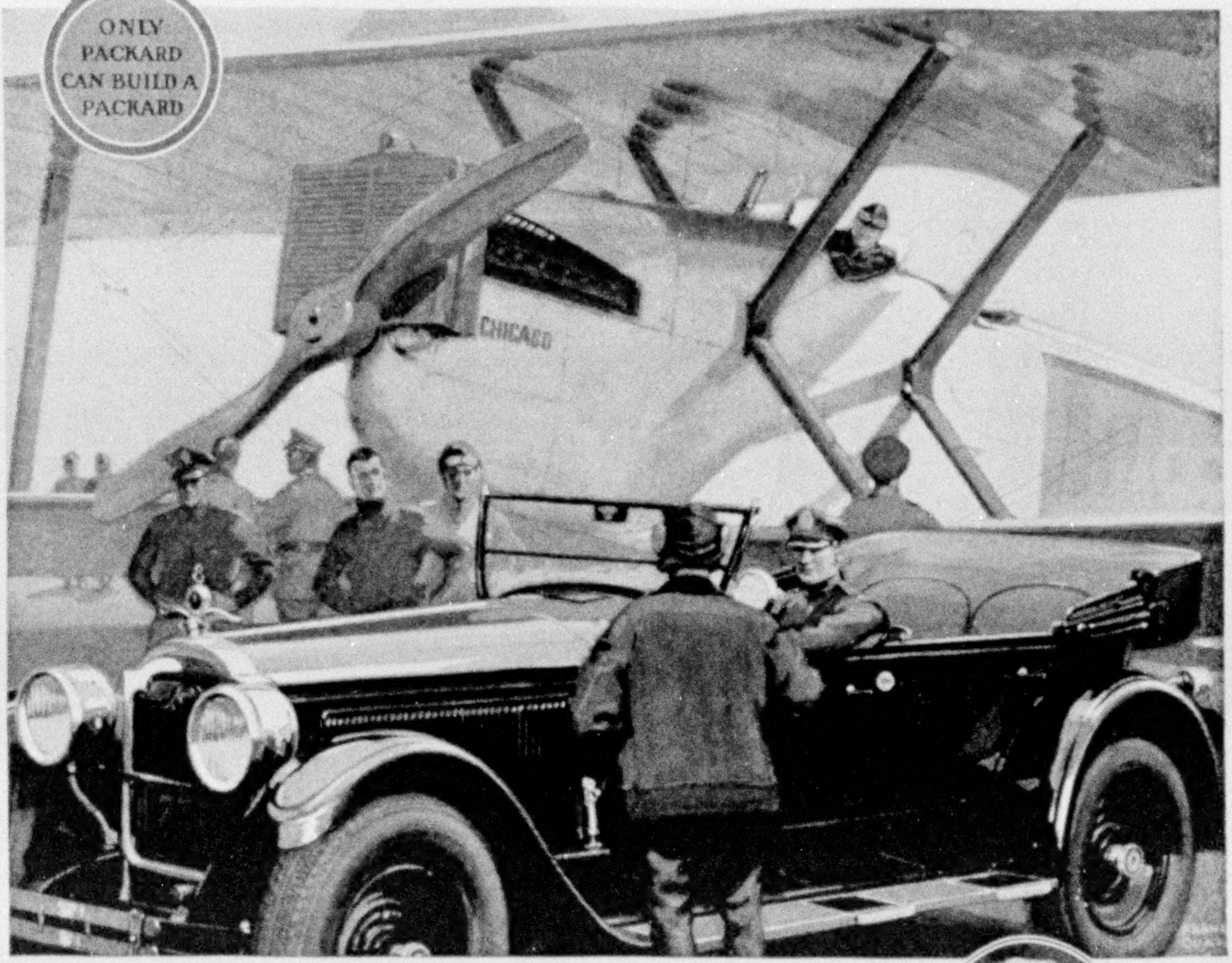
ROUND THE WORLD FLIERS CHOOSE PACKARD EIGHT



On November 9, 1924, Mayor Dever, on behalf of the citizens of Chicago, presented Capt. Lowell H. Smith and Lt. Leslie P. Arnold each with a Packard Eight sport model—the car of their choice.

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Above: Captain Lowell H. Smith

Below: Lieutenant Leslie P. Arnold

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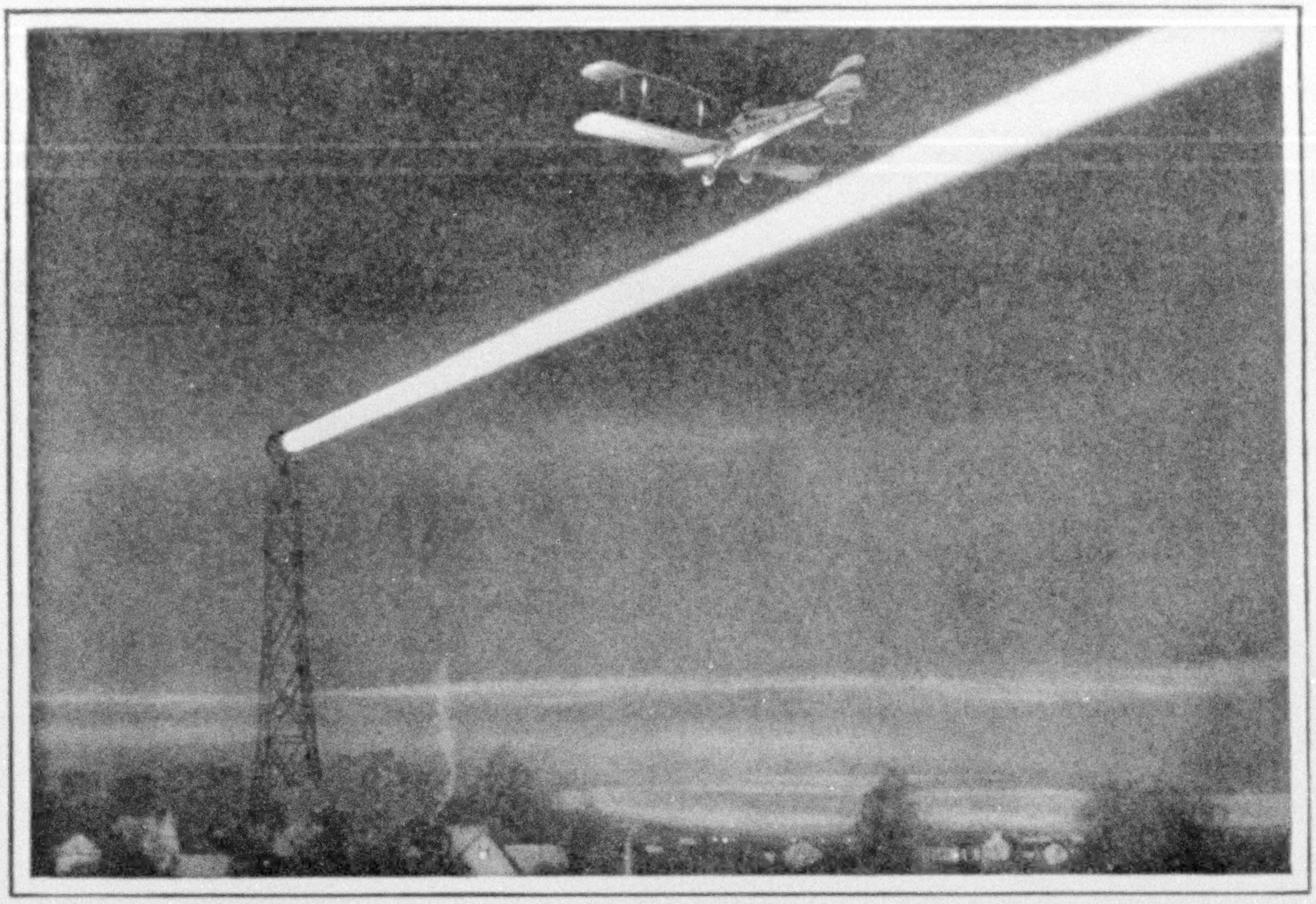
ASK THE MAN WHO OWNS ONE



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Revolving on great steel towers, General Electric searchlights, totaling 1,992,000,000 candle-power, blaze a path of light for the airplane pilot.

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GENERAL ELECTRIC

JOHN POWELL AT HIS STEINWAY

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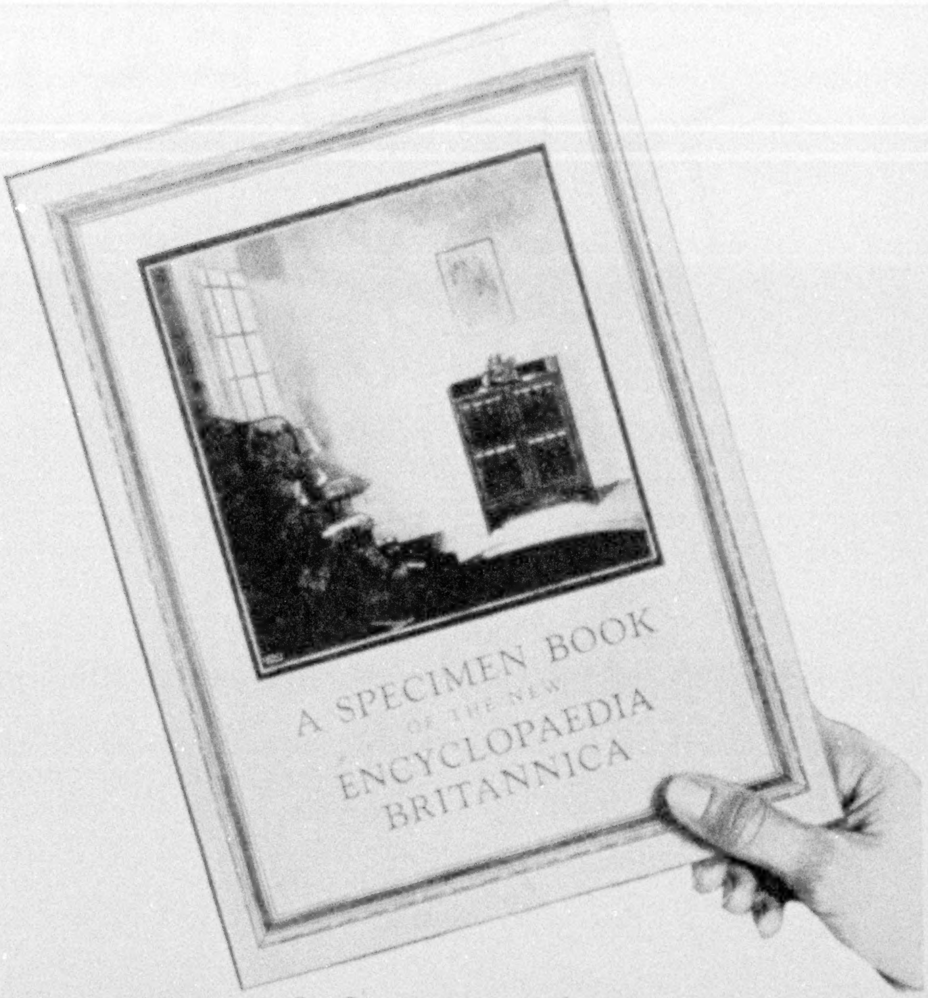

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MAJESTIC

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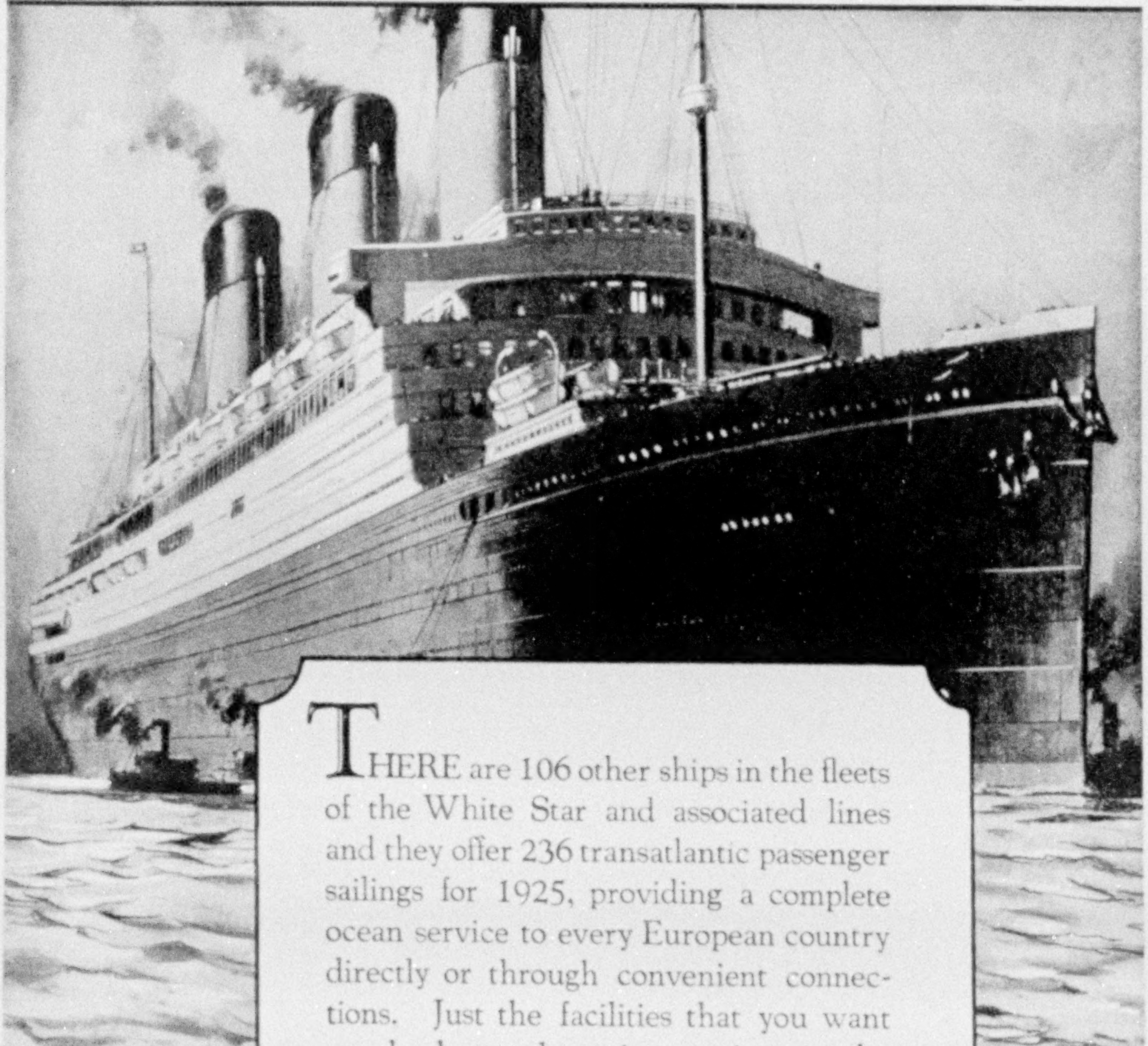

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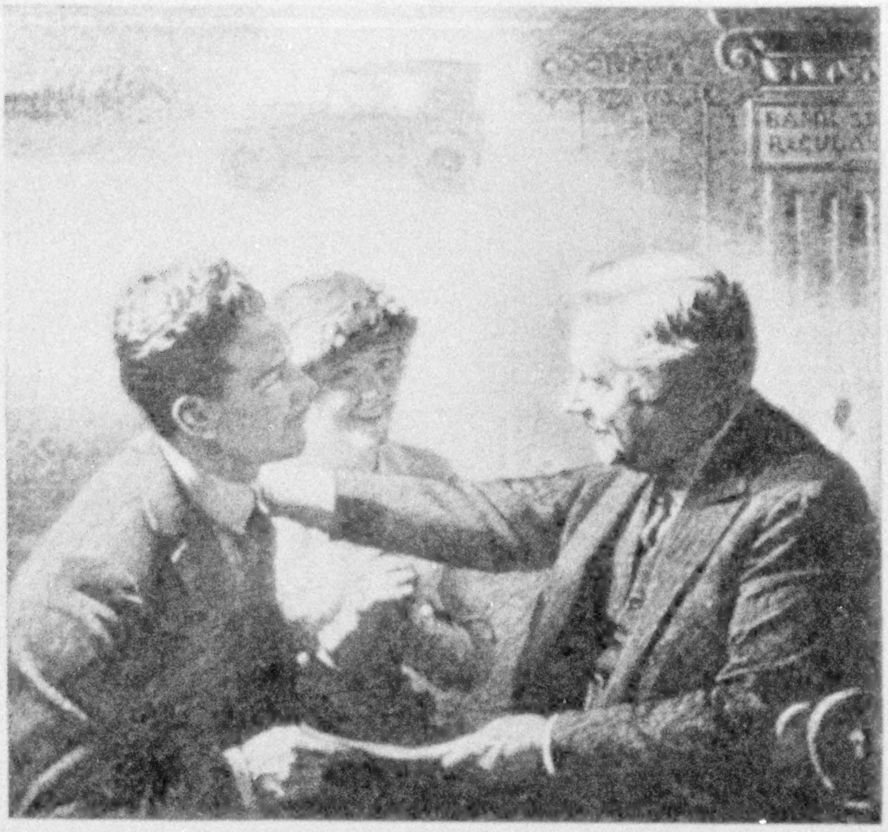

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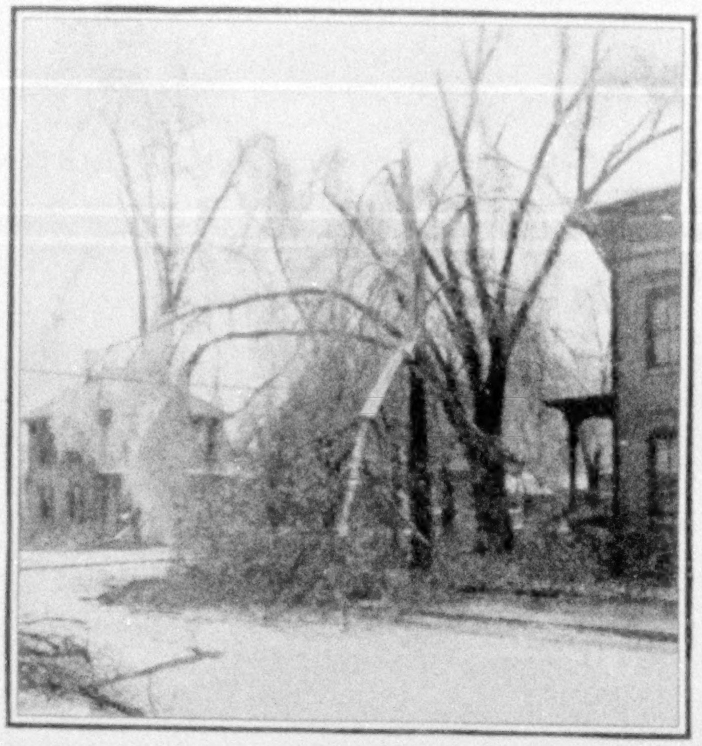

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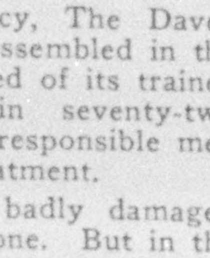

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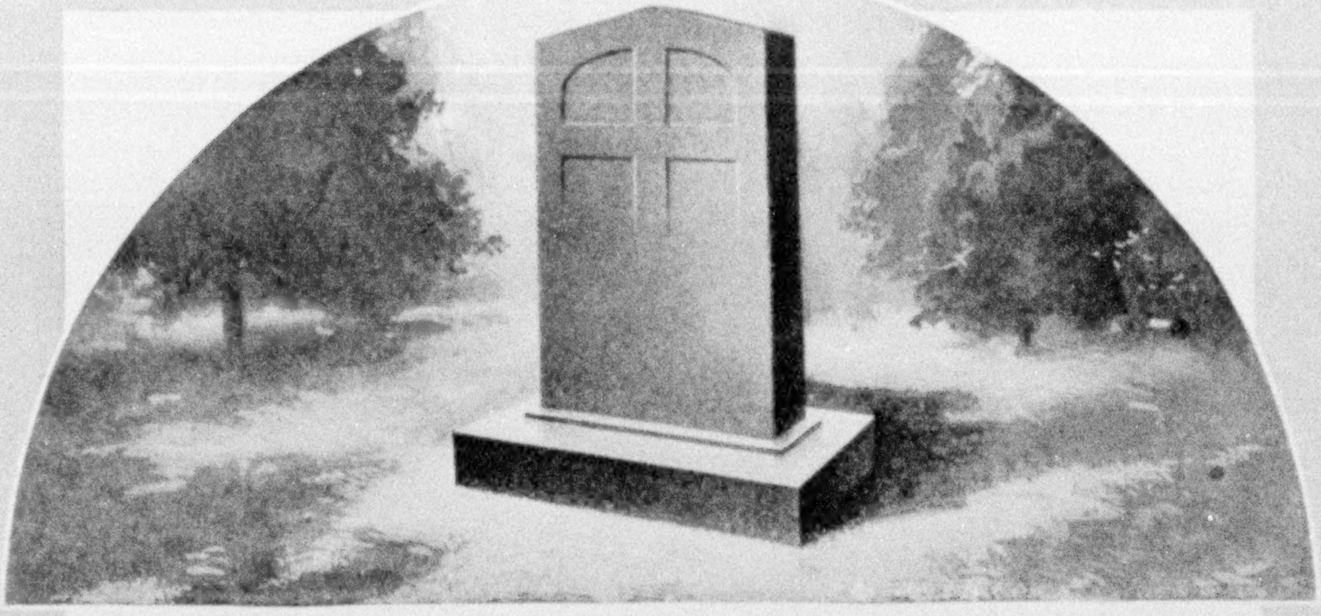

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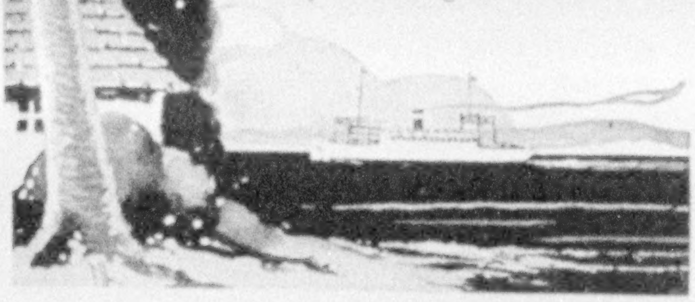

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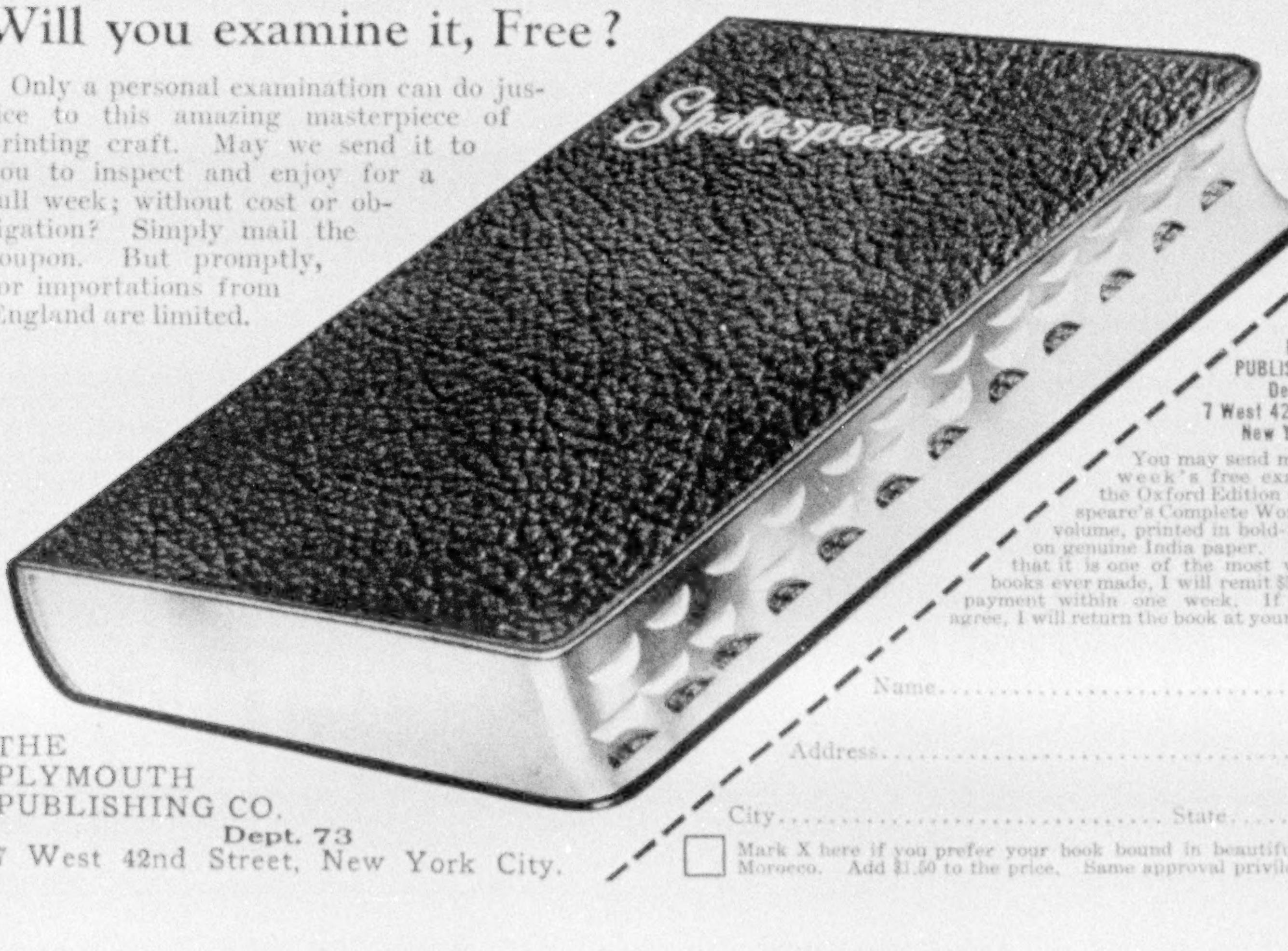

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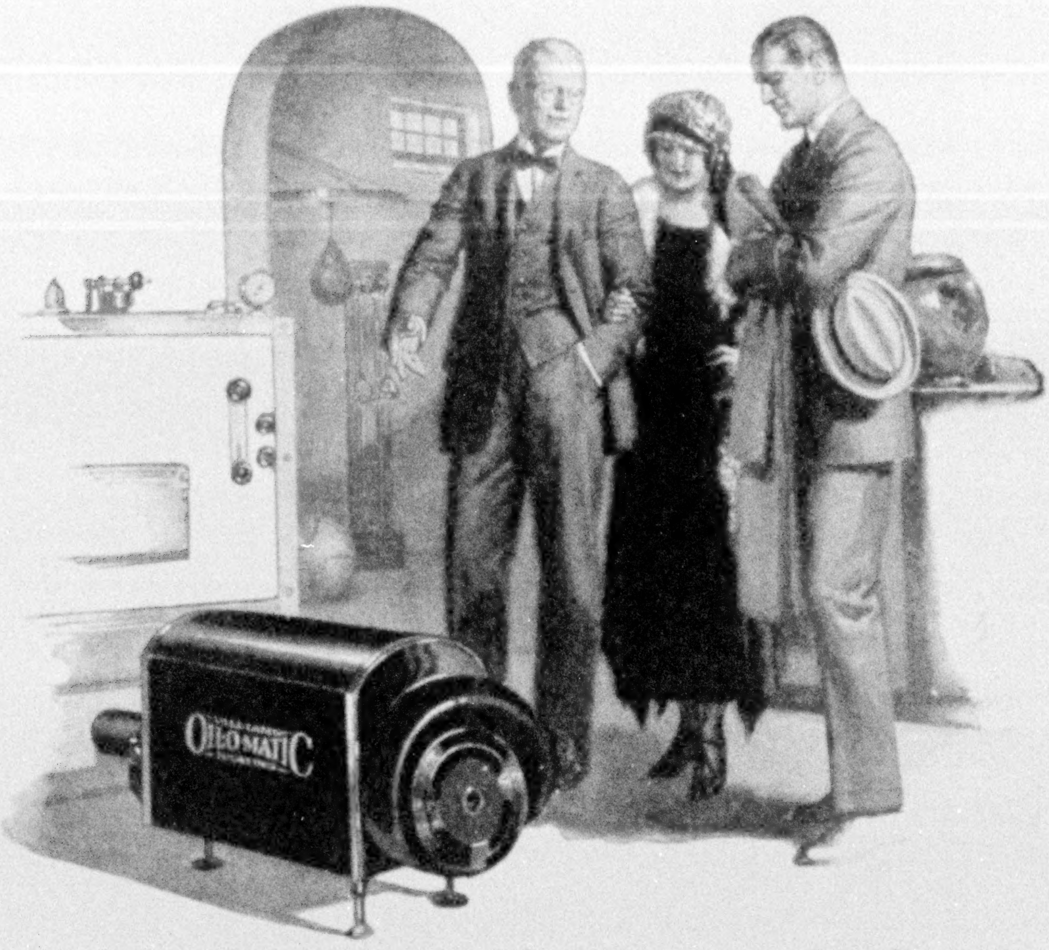

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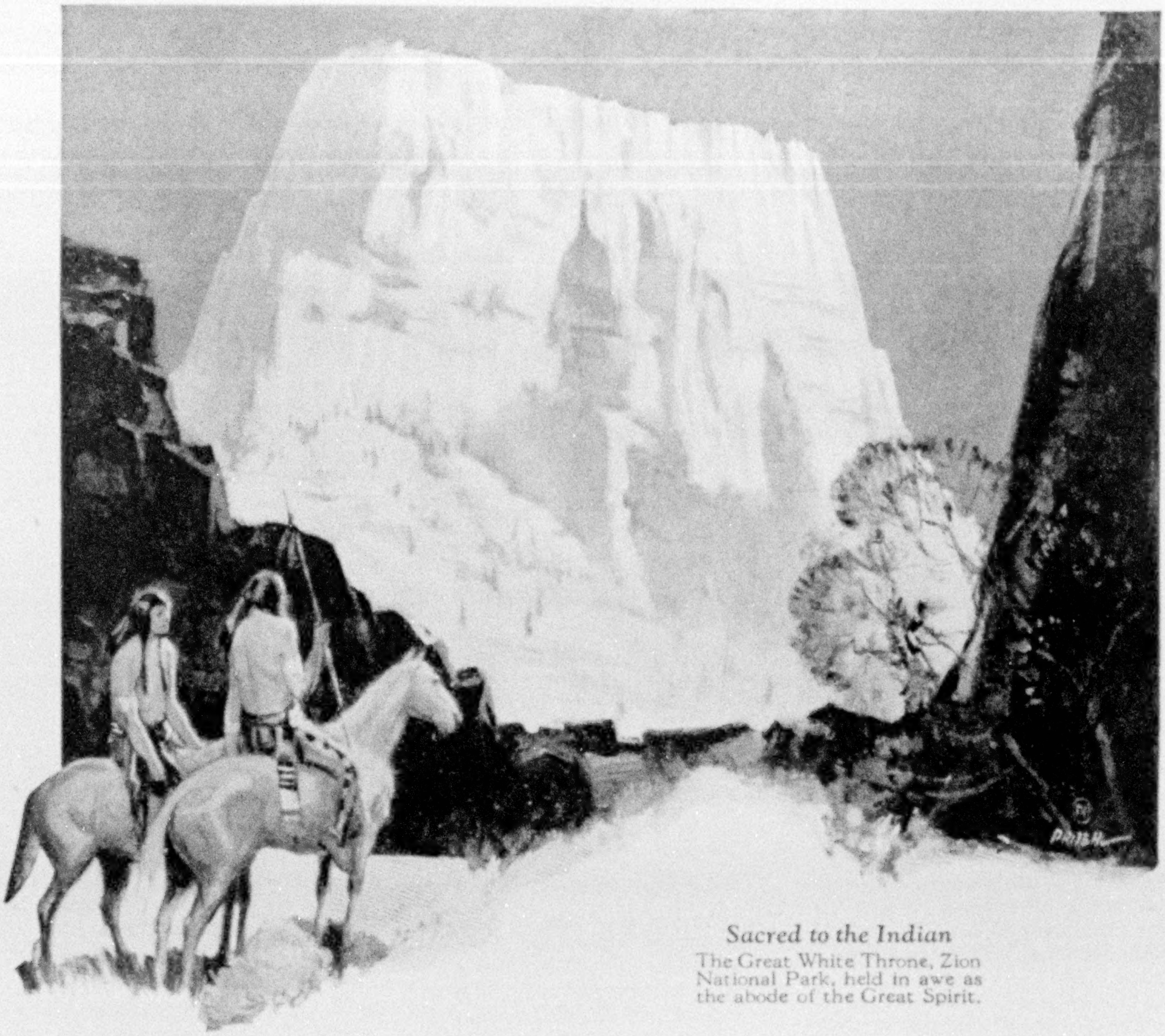

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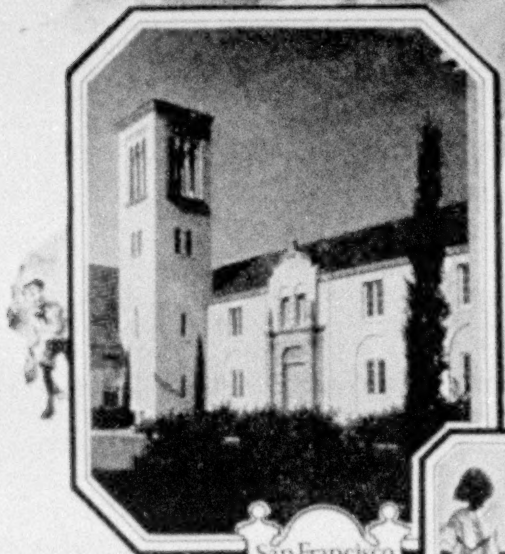

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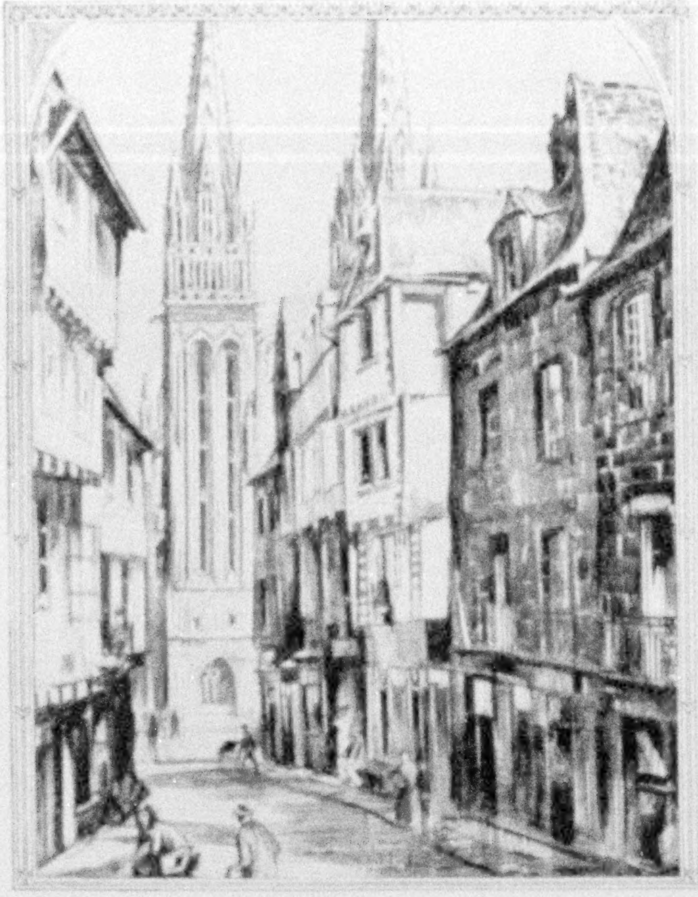

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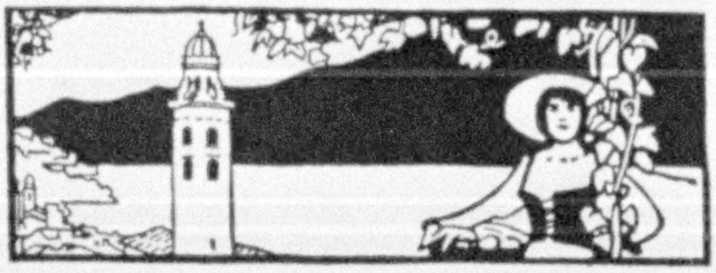

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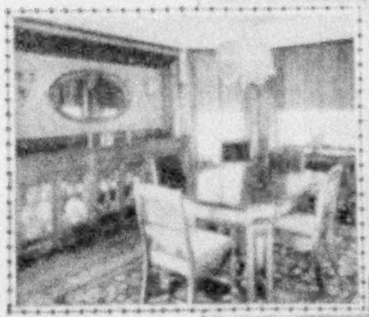

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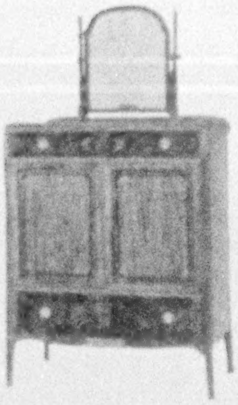

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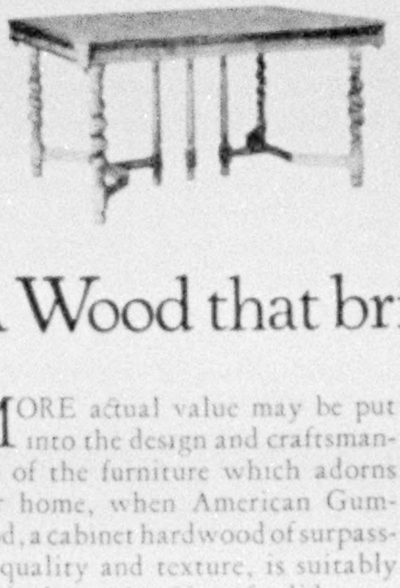

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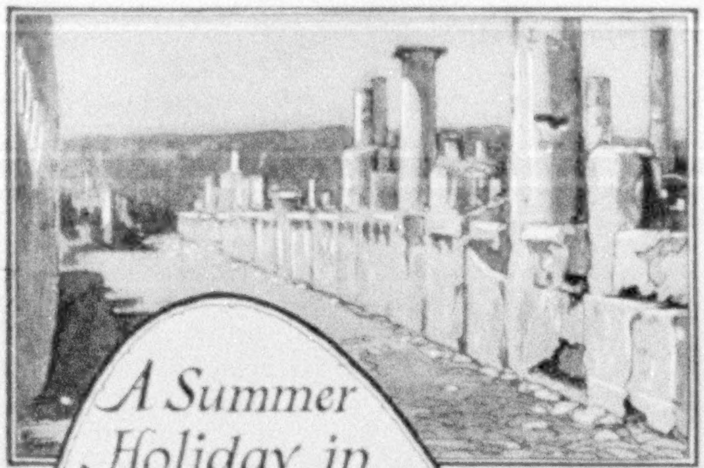

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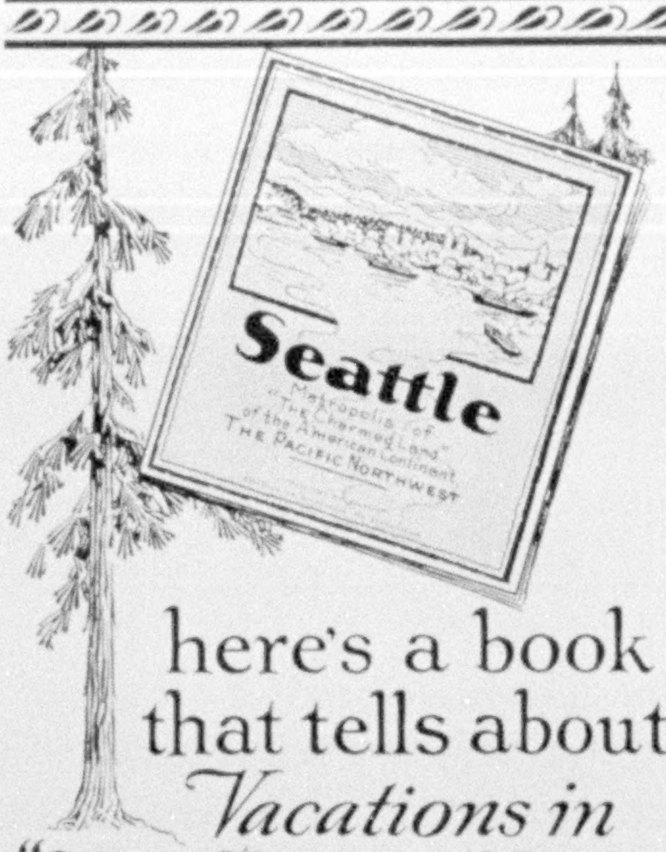

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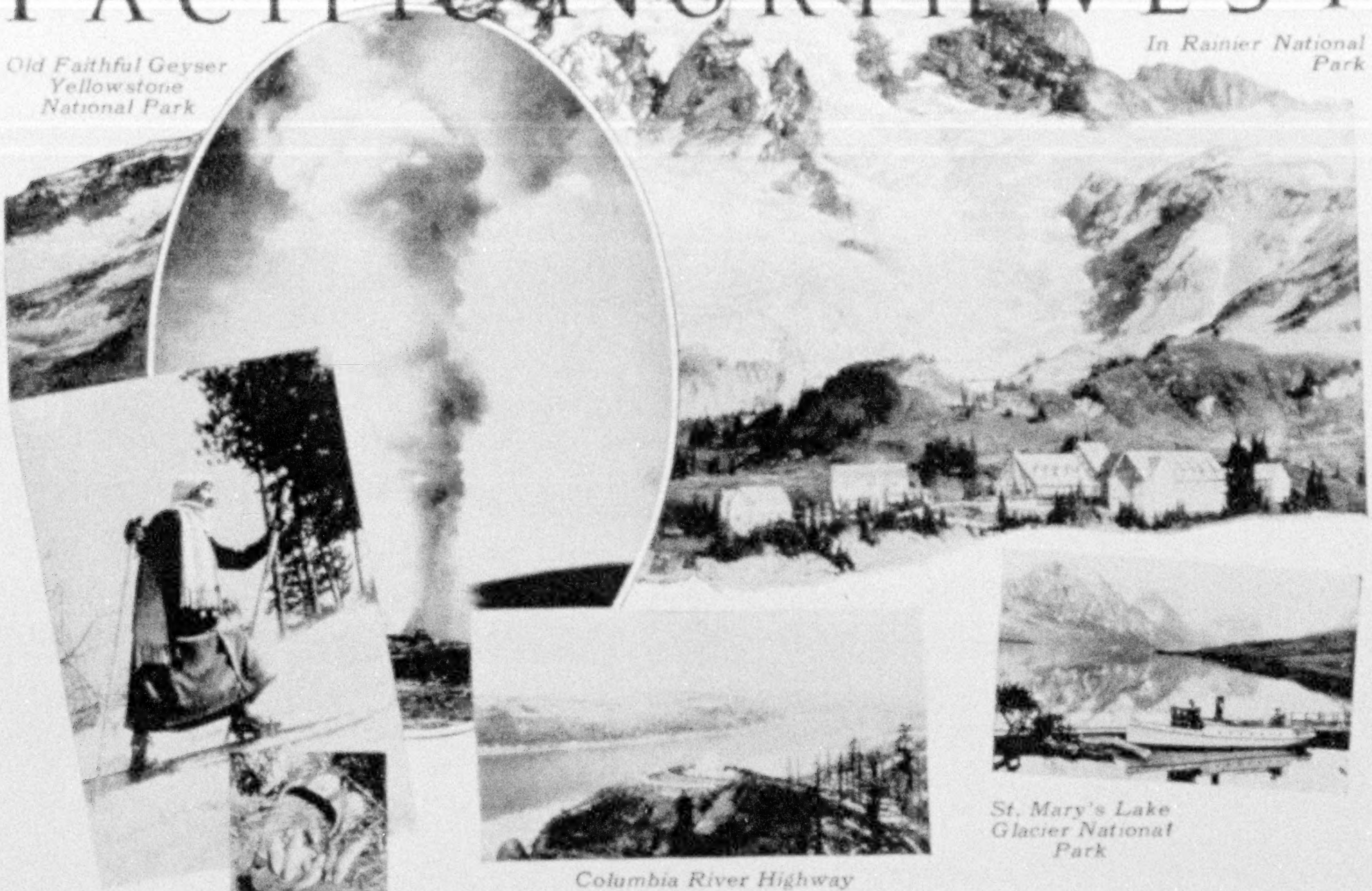

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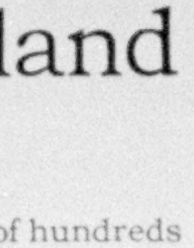

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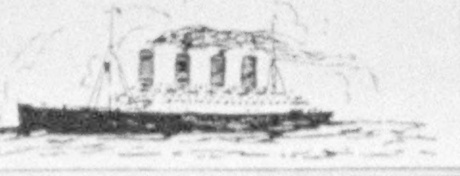

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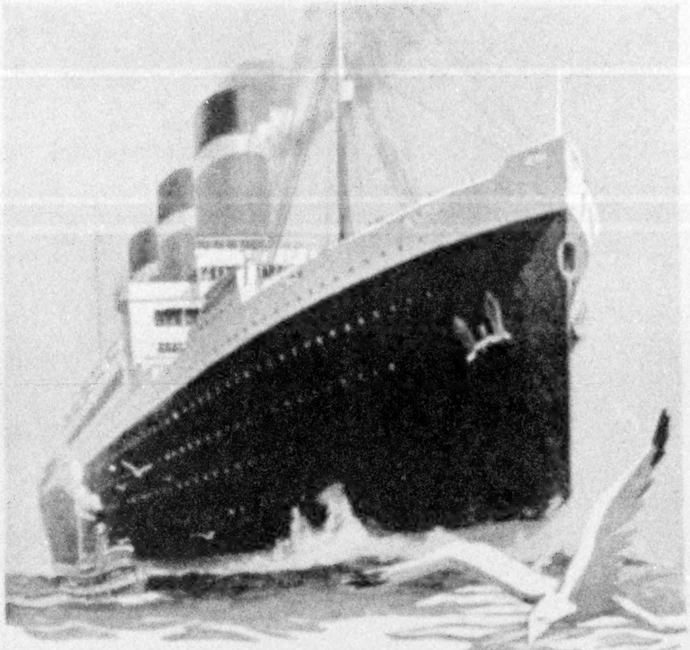

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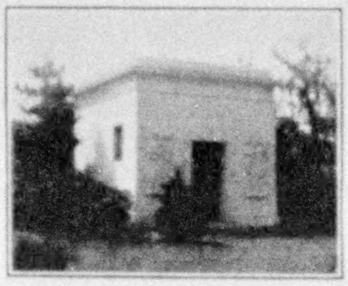

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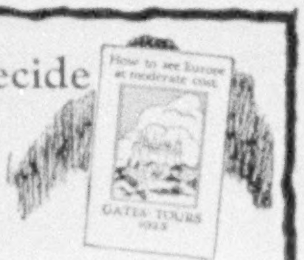

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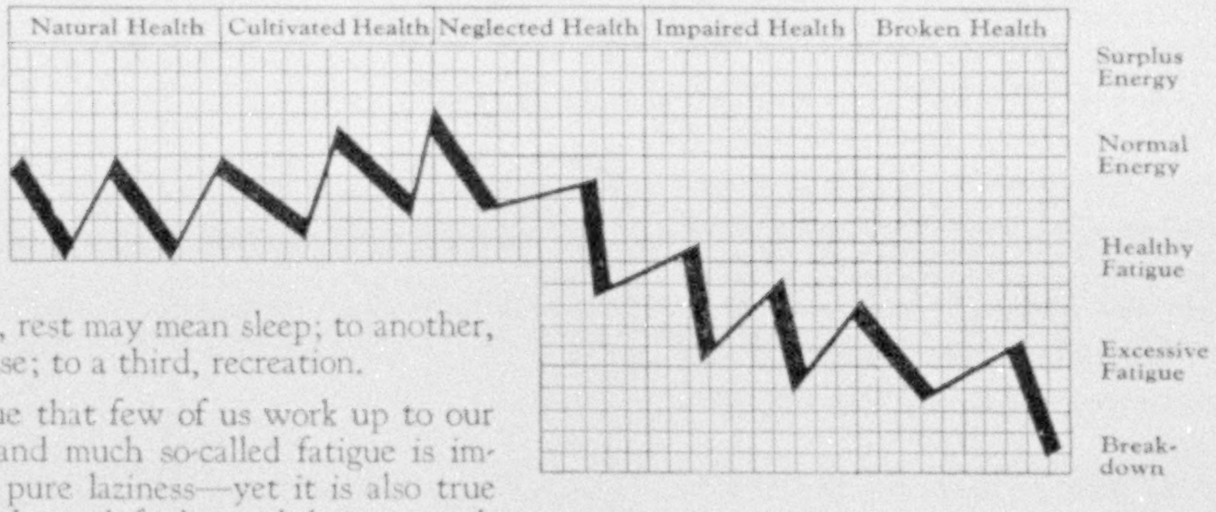
Pay Yourself Back

ARE you tired? It is getting close to the time of year when people talk of feeling "all tired out" and there is much discussion of spring tonics. If you are fatigued and there is nothing organically wrong, the tonic you need and probably the only one you need is the right kind of rest to restore your energy.

This graph shows what happens when more energy is used by wear and tear than is paid back by rest.



To one person, rest may mean sleep; to another, physical exercise; to a third, recreation.

While it is true that few of us work up to our full capacity, and much so-called fatigue is imagined or just pure laziness—yet it is also true that many people work far beyond their strength without realizing the danger.

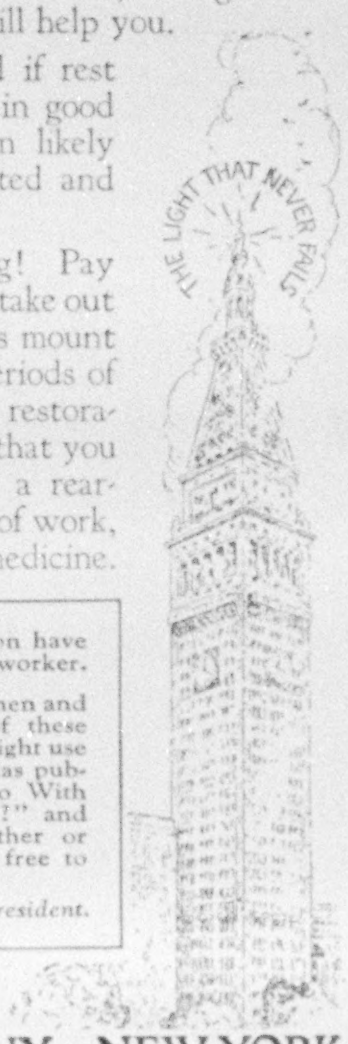
A certain amount of fatigue after exertion is natural, but excessive fatigue is Nature's safety-device for warning that rest is needed. When you are over-tired, you are more susceptible to disease.

What brings about excessive fatigue? Usually over-strain—either physical or mental—and insufficient rest. Because your activity is both of the body and the mind, and one reacts on the other, your fatigue is a close interlacing of physical and mental weariness. Neither can be relieved separately. Worry, fear, resentment, discontent and depression also cause fatigue. The tired man is often a worried man, and the worried man is usually a tired man.

If hard physical work is making you feel "all in" you may require more hours of sleep than usual even though this may mean temporarily giving up some form of amusement. Perhaps you are not eating the right amount of energy-making food. If you are a mental worker the kind of rest you probably need is exercise in fresh air. If excessive emotion is making you tired, the right kind of recreation probably will help you.

If you tire too easily and if rest does not put you back in good condition, it is more than likely that your health is affected and needs attention.

Workers—take warning! Pay back the energy that you take out of yourself. As the years mount up, longer and longer periods of rest are necessary to make restoration. The "spring tonic" that you need most likely is just a rearrangement of your hours of work, play and rest, and not medicine.



Employers of labor are coming to find that excessive, unnecessary fatigue entails loss of production and loss of earning power. It is said to be a factor in the occurrence of work accidents and is closely related to the cause or aggravation of most cases of severe sickness.

Tests have shown that in connection with certain occupations output can be increased and fatigue decreased by arranging rest periods. Here in the Home Office of the Metropolitan Life Insurance Company, our more than 9000 employees have two rest periods, one in the morning and one in the afternoon. These periods of relaxation have a beneficial effect on both the work and the worker.

There are many hours of the day when men and women do not work. The good use of these hours is as important to health as is the right use of working hours. The Metropolitan has published a booklet, "What Would You Do With 36,000,000 Minutes (70 years of life)?" and another on "Industrial Hygiene." Either or both, of these booklets, will be mailed free to those who ask for them.

HALEY FISKE, *President.*

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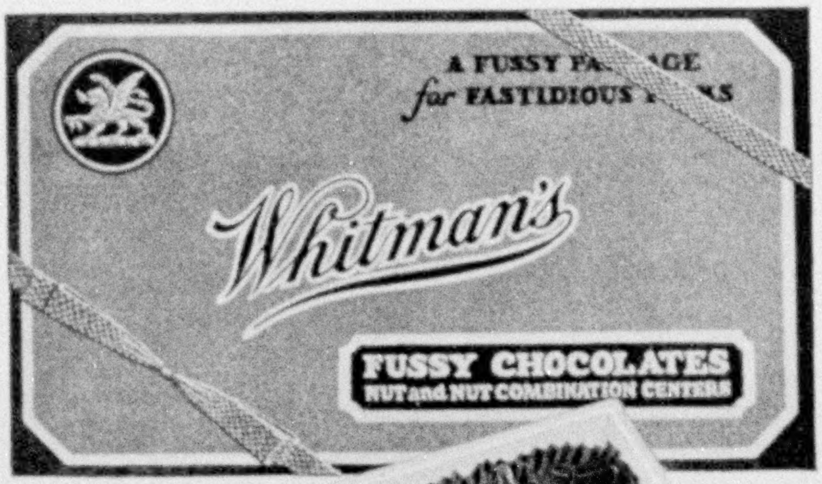

The Fussy Package contains chocolate pieces enclosing Almonds, Walnuts, Filberts, Peanuts, Brazil Nuts, Pecans, Double Walnuts, Pecan Caramels, Triple Almonds, Nougat, Nut Bricklets, Nut Brittle, Almond Dates, Double Peanuts, Nougat Caramels and Almond Caramels. Packed in boxes from half pound to five pounds.

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LOOKING DOWN ON EUROPE

The Thrills and Advantages of Sight-seeing by Airplane, as Demonstrated on a 6,500-mile Tour Over Commercial Aviation Routes

BY LIEUTENANT J. PARKER VAN ZANDT

U. S. Army Air Service

"NO, SAH!" said Jo, our dusky man of all trades, when I asked him if he had ever flown. "Terrah firmah fo' me! An' de mo' firmah, de less terrah!"

But Jo is behind the times. Five years ago he might have been expressing, in a manner after his own kind, the instinctive sentiments of a large number of our citizens. To-day his position is no longer tenable. Europe has proved it. The remarkable growth of air transportation services on the Continent during the last six years, carrying close to 200,000 passengers and thousands of tons of mail and merchandise between the principal European cities, leaves no reasonable doubt that aircraft, as safe, reliable transportation agents, are here—and here to stay.

It was my good fortune recently to make an investigation of this development for the War Department, and to travel as a passenger some 6,500 miles over Europe on English, French, Rumanian, Polish, German, and Dutch air lines.

I had my initial first-hand report on European airways during our last night out of New York, from the Channel pilot who had come aboard. "Mayor of Dover," the Captain called him, in deference to his position as councilman in the Channel town that lies on the route of the English and French planes flying daily between London and Paris.

A big, burly Scotsman, with a voice like a husky foghorn, he paced the bridge where I had been allowed to remain, and, between instructions to the yeoman at the wheel, told me of air transportation, while the winking silver line of lights of Brighton slipped behind us and the chalk cliffs of the Dover coast shone dimly in the moonlight (see pages 269 and 273).

"It was the mail plane for Paris," said the "Mayor," "that first interested me in aviation. It would go over my head like clockwork every morning, as I walked to the office; I used to listen for it, and it was so regular you could set your watch by it.

RADIO GUIDED PLANES ENVELOPED IN FOG

"What kind of weather it was didn't seem to make any difference; on clear days it might be just a speck in the sky, and then when the fog was on the cliffs, it would roar down the street just above the housetops and disappear in the mist over the harbor. There were times I couldn't see it at all, and only the muffled

Photograph by Lieutenant J. Parker Van Zandt

THE HANDLEY-PAGE PASSENGER TRANSPORT PLANE IN WHICH THE AUTHOR FLEW FROM LONDON TO PARIS

Mechanics are seen checking up the engine and propeller installation before the plane is scheduled to depart. The pilot's and flying mechanic's cockpit may be seen forward of the passenger compartment, in the nose of the plane.

roar of the engines somewhere overhead betrayed its passage.

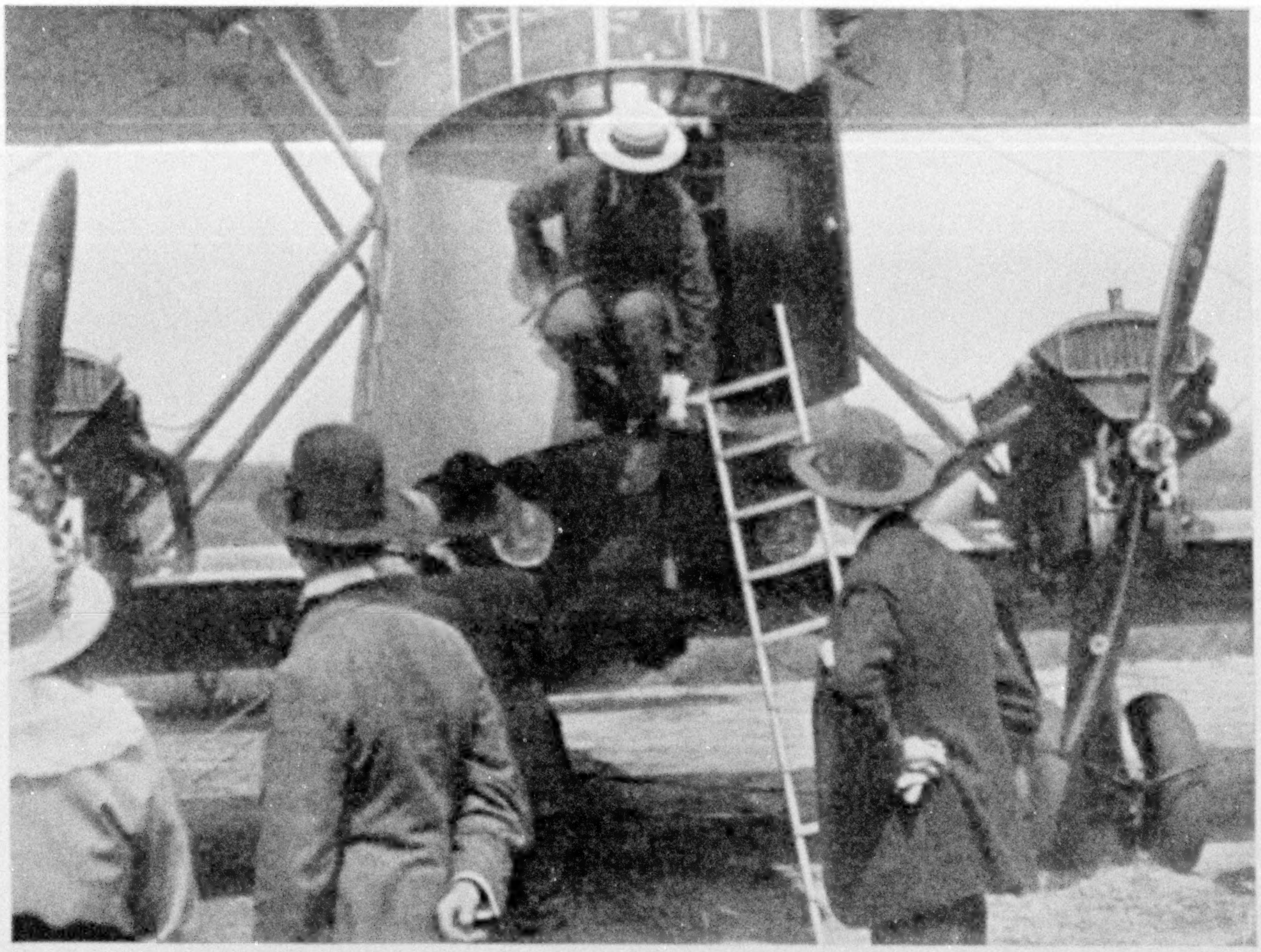
"I got to wondering how they found their way up there, in such thick weather, and then one day I stumbled on the secret. You see, my boy is pretty keen on radio and we have a set at home for the city concerts. One day, while tuning in, we picked up a pilot somewhere in the air, talking to the flying field at London. That chap was getting reports on his position in the sky and about the weather along the route; thought he ought to be getting near the Channel, but couldn't see it. In two or three minutes Croydon was telling him where he was—over a small fishing village on the French coast.

"Well, sir, that made me a bit interested, I can tell you. I began to read some Air Ministry reports about aviation and they opened my eyes. I found there were regular air lines all over Europe that could take you most anywhere you wanted to go; you can hop into a plane to-morrow in London and fly right across Holland and Germany to Moscow, Russia, or up to Helsingfors, Finland; or you can slip over to Paris and on to Constantinople, or down across the strait to Algeria and Morocco.

"England isn't so far behind the others, I guess; some 50,000 passengers have flown across the Channel since the Armistice, and most of them have traveled in British machines. Not one of these English fellows has ever landed in the water, but there was a Dutch plane a couple of years ago, with three passengers aboard, that came down in the Channel; landed on the Goodwin sands, and a Channel freighter took the pilot and passengers off and brought them over to Dover.

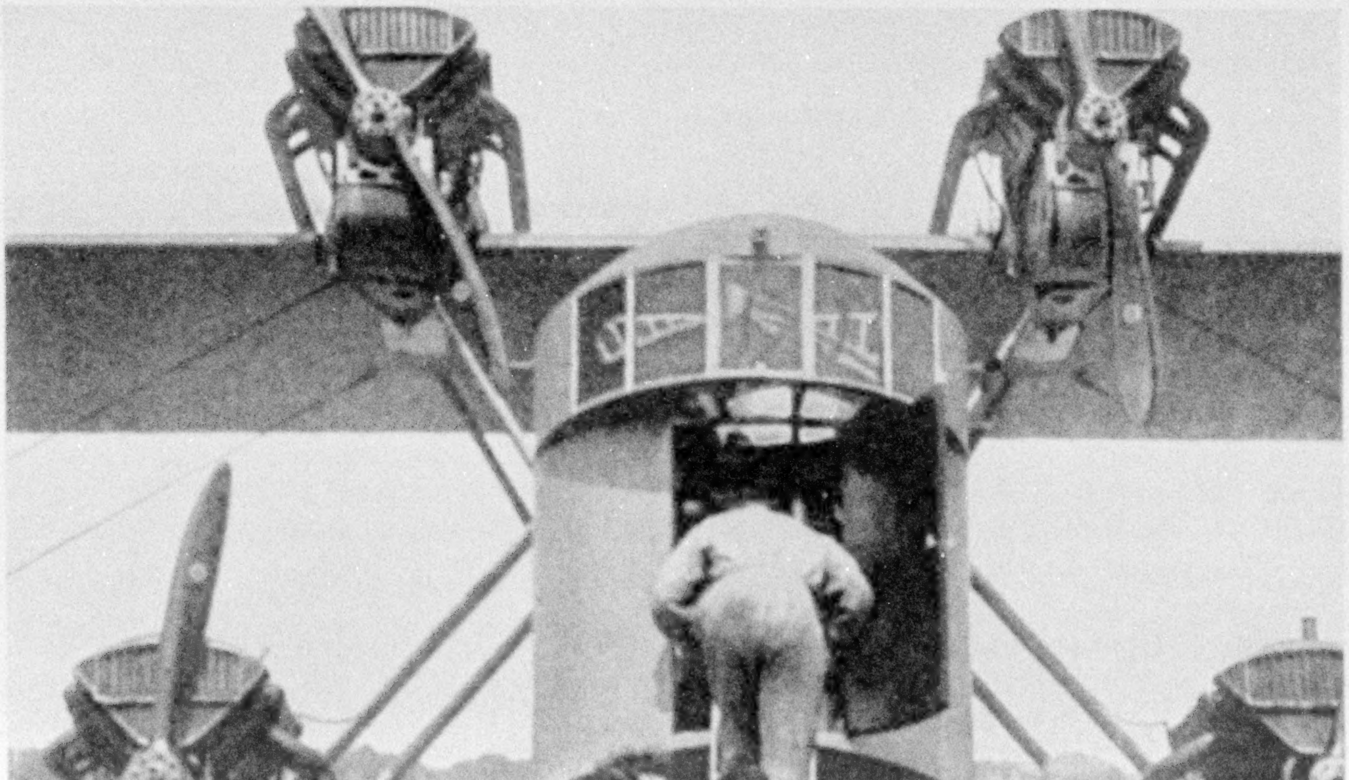
"So you are going to travel on all the air lines in Europe this summer? Well, I declare! I believe I envy you. Good luck—and safe landings."

An object for envy I felt, too, when a few days later I climbed into the British Imperial Airways bus at Trafalgar Square



A FOUR-ENGINE BLERIOT PLANE UNDER TEST FOR LONDON-PARIS SERVICE

Note the lights for night landing, mounted just beneath the floor of the fuselage.

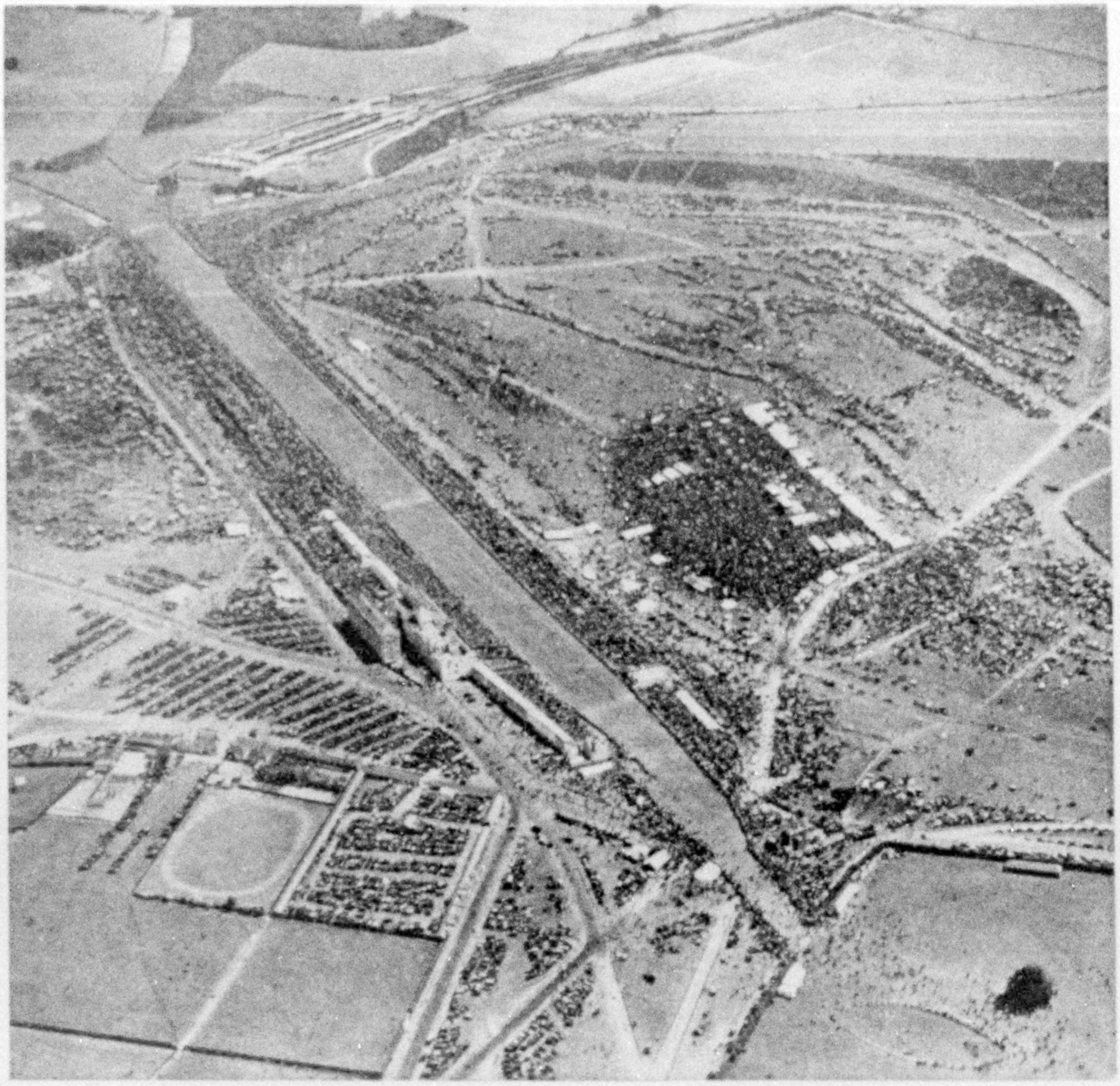


Photographs by Lieutenant J. Parker Van Zandt

ANOTHER VIEW OF THE FOUR-MOTOR PLANE SHOWN ABOVE

Passengers and pilot may enter by the door in the nose of the fuselage or through a similar door in the side.

XUM



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DERBY DAY AT EPSOM

A few miles to the southwest of Croydon, the air station of London, is the most famous race course in the world, Epsom Downs, where the "Oaks" and the "Derby," established in 1779 and 1780, respectively, by the twelfth Earl of Derby, are run annually before hundreds of thousands of spectators.

bound for the flying field—and Paris. There were eight of us in the car, of whom five were Americans — in fact, Americans form the major part of the cross-Channel air traffic.

Two silent Chinese girls, in the latest European styles, sat wedged in one corner, while beside them a loquacious broad-brimmed Oklahoman held conversation with a stout, bejeweled lady from Texas.

Some sense of sharing an adventure in common seemed to penetrate for the time that air of stiffness so habitual between strangers thrown together by the hazard of travel. Certainly there was nothing to dissipate it in the ride out through the crowded London streets to the London Terminal Aërodrome at Croydon—bowling down winding lanes at 40 miles an hour.

AIR STATION PRESENTS THE ASPECTS OF A RAILWAY TERMINAL

To any timid passenger the sight that met us at the field would have been very reassuring. An imposing row of offices and waiting rooms of the Dutch, French, and British services, a courtyard before the Customs building well filled with limousines and busses, a bustling and

scurrying to and fro of tourists and attendants—the normal pulse and movement of a typical railway station.

The noon liner from Paris had just arrived, a French bimotored Goliath, and stood among a group of planes beyond a picket fence that separated us from the flying field. Its big propellers were still idly turning over, the last of its dozen passengers just emerging through a doorway in the fuselage.

OUR PILOT HAD BOMBED THE CAPITAL OF AFGHANISTAN

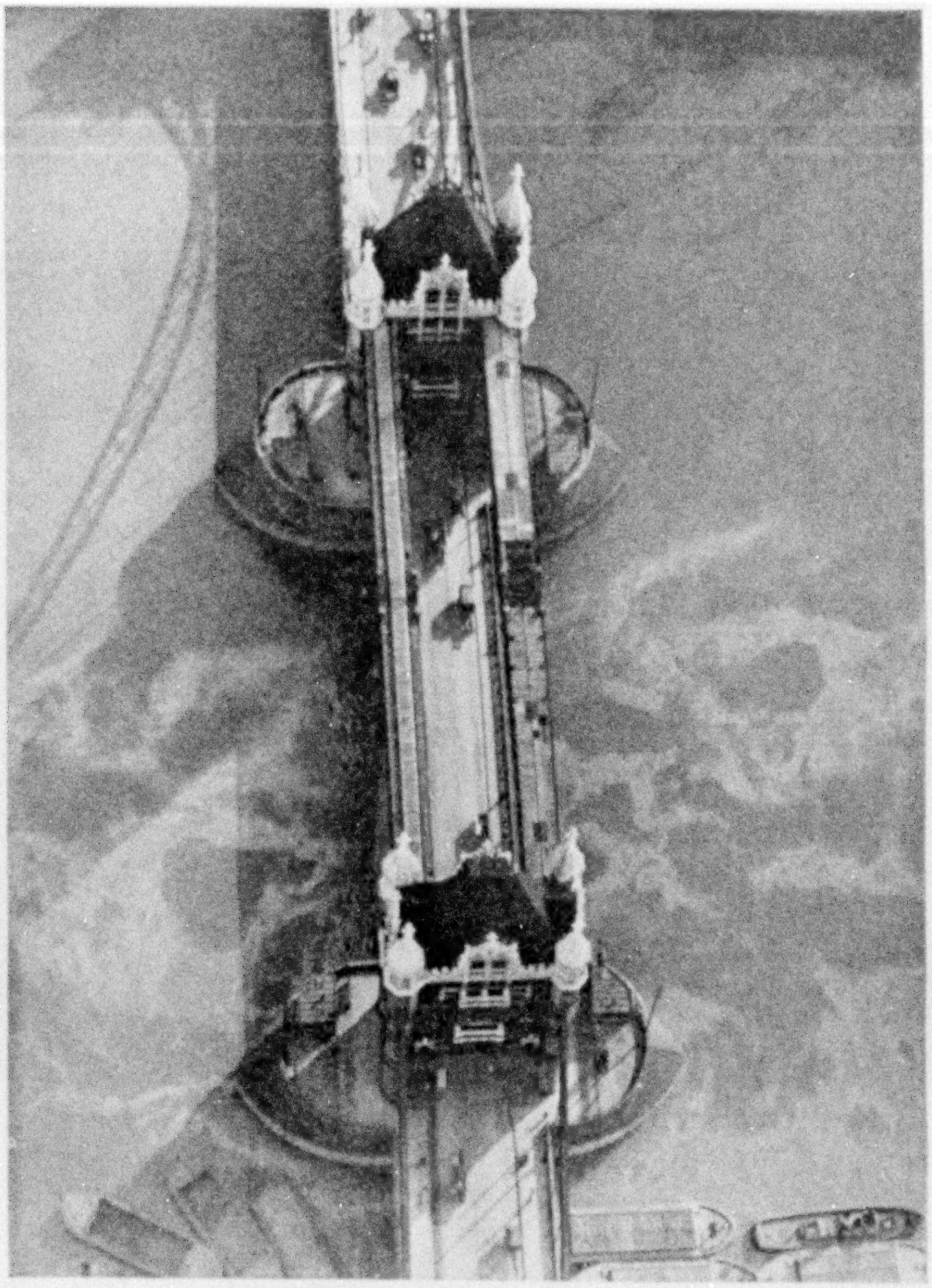
A pompous, uniformed guard stood beside a large traffic board on which the positions of the planes en route along the airways were represented by various colored tacks. To him I appealed to point out our pilot.

"There 'e is," said my informant, indicating a stocky youth in a worn leather coat, leaning against the wing of a Handley-Page. "Hi'm told 'e's frightfully hunpopular in Hafghanistan. You see, 'e was flying a bomber down there, and 'e dropped 'is load on the Hamur's 'arem."

It is one of the boasts of the Croydon field that its customs officers are as expeditious and efficient in their sphere as is the aircraft itself in its own element. I soon found myself comfortably installed in the seat of honor beside the pilot in the nose of the *Princess Mary*, the two Rolls-Royce engines close behind me on either side, under half-throttle, humming tranquilly their message of latent power.

A messenger came scurrying out, waving the final clearance papers for the pilot; a burst of blue smoke and a rising roar from the starboard motor, and the great plane began to circle slowly out from the line of hangars toward the green field.

An airplane on the ground is an unwieldy creature, and we bounced along over the uneven turf, as the pilot cautiously sought the far corner, from which we had a clear run of the length of the



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LOOKING DIRECTLY DOWN UPON THE TOWER BRIDGE, LONDON

It has been suggested that the Thames River might be used as a landing base for airplanes in the heart of London, to avoid the long bus trip out to the terminal field at Croydon. The presence, however, of the numerous bridges and innumerable small craft on the river and the prevalence of low fog and other unfavorable water conditions make this suggestion impracticable at the present time.

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ST. PAUL'S CATHEDRAL, LOOKING WEST DOWN LUDGATE HILL: LONDON

The beauty in proportion and perspective of many great public buildings is not truly appreciated until they have been seen from the air.

aërodrome for our take-off into the wind. A sudden, engulfing, devastating roar, as the throttles of both engines were fully advanced, control wheel well forward to raise the tail of the plane, and we began to roll swiftly ahead, gathering fresh momentum with each fleeting instant.

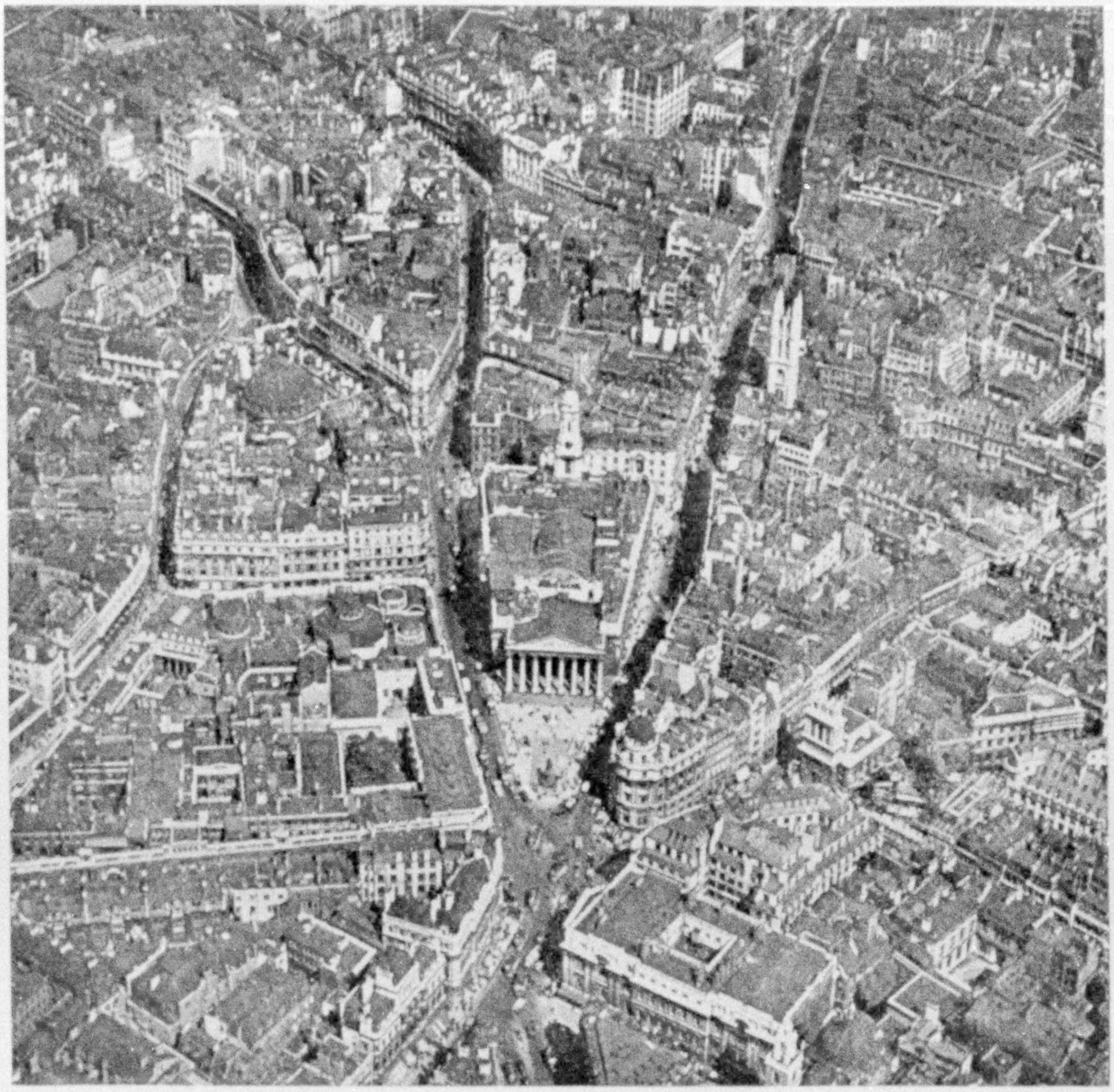
THE AIRPLANE IS A MAGIC CARPET BEARING ONE THROUGH THE SKIES

One is scarcely conscious of the actual moment of leaving the ground until the absence of further jolting and the slight billowing effect, as the wings cushion in the warm air, make one realize with a peculiar thrill that he is off at last on his great adventure. The near-by hangars, trees, and hedges flash by the wing tips in a blur; then the ground seems to be wafted gently downward and the whole sweep of the surrounding countryside comes into view as the pilot zooms to a higher altitude.

There is no sense of dizziness, no sudden feeling that the solid earth is deserting the feet; just a growing sense of release, a feeling of age-old restraints cast off, like a sigh of relief from the soul.

But the emotion of cross-country flight must be experienced to be appreciated. Like the taste of fresh olives, it defies description. There is a sense of exhilaration and freedom invoked by the spectacle of green hills and dales streaming rapidly away beneath, as one floats above with little realization of his own motion, save the knowledge that the checkered farm land just below in a brief space of time will be fading into an indistinct horizon far behind.

Some remote atavistic instinct is stirred at this sudden break with accustomed limitations, flooding one's soul with a new spirit of power and importance, as his magic carpet bears him swiftly through the sky.



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THE BUSINESS HEART OF LONDON AS IT LOOKS FROM THE AIR

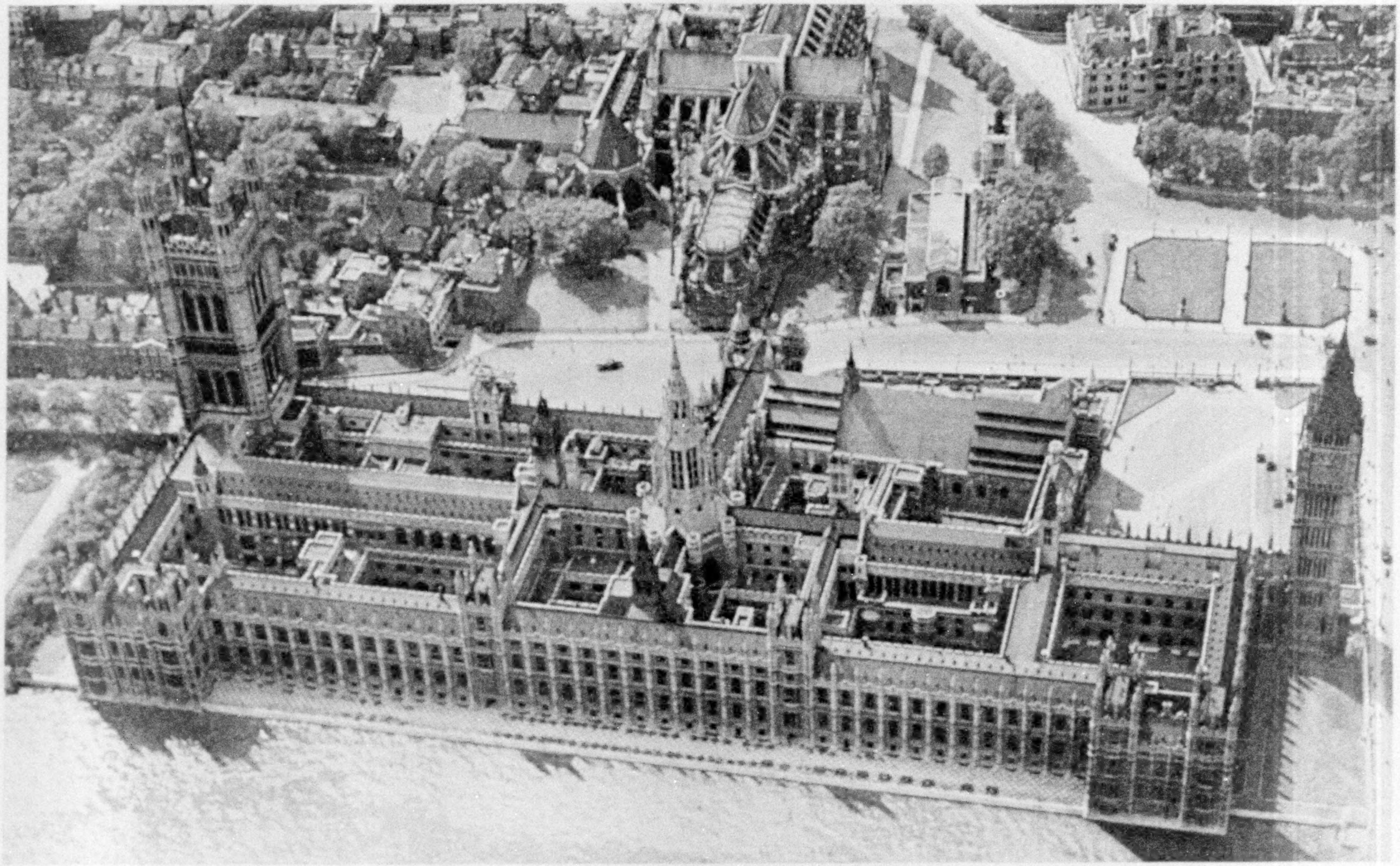
Note the absence of street cars and the great number of autobusses. In the center of the picture is the Royal Exchange (the building with the columns), and to the left is the jumble of roofs of the Bank of England, immediately beyond which is the Stock Exchange. At the bottom of the picture, in the center, is Mansion House, the residence of the Lord Mayor.

Flying a few hundred feet above a low-lying range of hills, we skimmed past several magnificent English manors, their well-kept grounds laid out with geometric precision.

The white ribbon of the road curved over the hilltop and down the valley, beckoning us to follow, while the ever-changing and widening vista of the English countryside held the attention enthralled. To be truly appreciated, England must be seen from above—"her sights and sounds, dreams happy as her day."

There was something warm and refreshing in this embracing vision of friendly cottages hidden in foliage, winding lanes bordered with hawthorn hedges, and the mile after mile of cultivated fields upon which the golden harvest now stood ripening, as we sped in an unveering line over hill and coppice.

It has been said that an English summer consists of two days of sunshine and a thunderstorm, but our weather could not have been more ideal. The air was clear and warm, as we neared the coast, and from an altitude of 1,500 feet we could trace the gray waters of the Channel far to the north toward the Hook of



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LOOKING DOWN ON THE HOUSES OF PARLIAMENT: LONDON

In the central background is Westminster Abbey. In Parliament Square, to the right, are statues of Sir Robert Peel, Lord Palmerston, the fourteenth Earl of Derby (1799-1869), Disraeli, and Canning.

Photograph by Aërofilms, Ltd.

THE SEA FRONT AT BRIGHTON, THE WATERING PLACE ON THE ENGLISH CHANNEL SO FREQUENTLY COMPARED WITH AMERICA'S ATLANTIC CITY

Note the row of white "bathing machines" on wheels. In the middle distance, at the right, is the Palace Pier.

XUM

Photograph from Lieutenant J. Parker Van Zandt

A FOUR-PASSENGER COMMERCIAL PLANE USED ON SOME OF THE AIR LINES BY AN ENGLISH AIRWAYS COMPANY, IN FLIGHT OVER SUSSEX

This plane may be hired to fly "anywhere any time," at a standard gross price of two shillings a mile. This includes the pilot's salary and all other expenses connected with the operation of the plane itself. Last summer an American business man hired such an air taxi and traveled some 12,000 miles over Mediterranean countries.

Holland, and south to where the water and the distant haze converged on an unreal horizon.

A TWO-HOUR BOAT TRIP CUT TO 22 MINUTES BY AIRPLANE

The rays from the afternoon sun threw a shadow of the plane on the earth below—a grotesque, miniature shadow that slipped silently over hedge and plowman and cottage, streaked across a field of yellow grain at the Channel's edge, slid precipitously down the chalky cliff, and without an instant's pause plunged out across the water.

A score or more of vessels were in sight, one big chap, outbound for some far-off port, lying directly on our path, black smoke streaming from the stacks, its murky track visible for miles in its wake. Our fleeting, streamered shadow eclipsed for an instant the tiny-appearing passengers crowding the hurricane deck, plunged a minute later over an old schooner making lazily for Zeebrugge, and darted on over the gray Channel waters toward the low-lying coast of France, which now showed on the horizon.

We were 22 minutes from Folkestone to Boulogne-sur-Mer, 22 glorious minutes against two difficult hours by Channel boat. The clean, white sand of Le Touquet beach (Paris-Plage) lay beneath us, as we swung inland.

Seemingly far ahead against the horizon hung an ominous bank of cumulus clouds, their flat tops in brilliant sunshine, while below the soft outlines of the open fields were submerged in shadow.

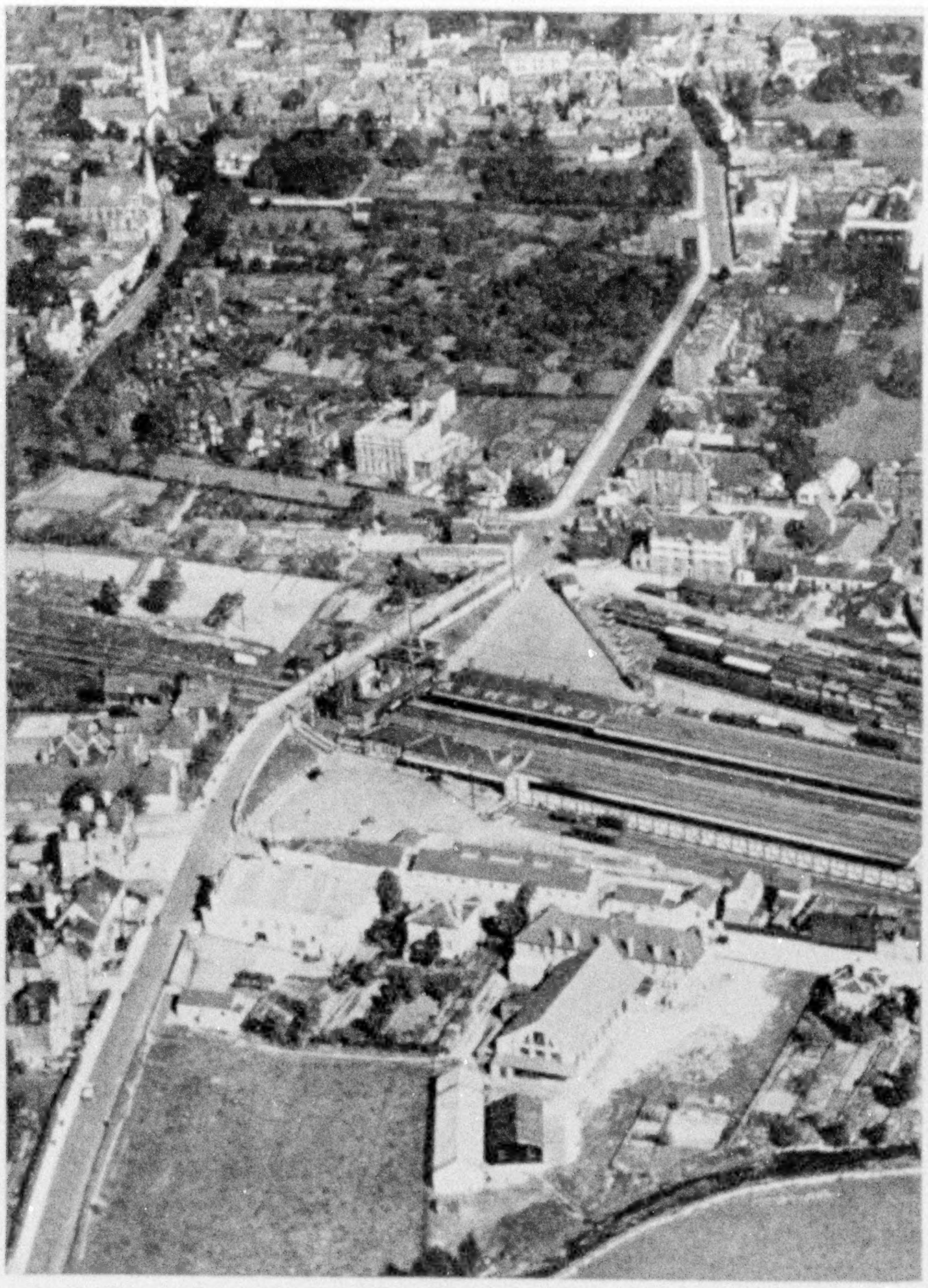
THE PILOT GETS WEATHER REPORT BY RADIO PHONE DURING FLIGHT

An aviator's life is said to consist of hours of idleness punctuated by moments of intense fear, but the pilot seated by my side would have quickly put to rout such a slander. At the moment, he was

talking into his radio phone, the mouthpiece of which was attached to a jointed metal sleeve strapped to his chest. I could see his lips moving, but no sound of words reached me above the enveloping roar of the engines mounted so closely on either side.

He switched the phone to receiving and in a minute leaned over, grinning, to shout in my ear that Le Bourget reported the sky clear as far as Beauvais, and that he would fly above the clouds the intervening distance.

Wisps of cloud were already drifting by, filmy gossamer outposts of the massed battalions ahead. Very different and harmless they appeared when seen close by, tossed by the slip-stream from our propellers, but rather frightening where the cross-wind currents crowded them into great pressure ridges towering hundreds of feet above our line of flight, or left dark, foreboding crevasses in the cloud floor.



Photograph by Aërofilms, Ltd.

ASHFORD, ENGLAND, ON THE LONDON-PARIS ROUTE, IDENTIFIES ITSELF FOR THE AIRMAN

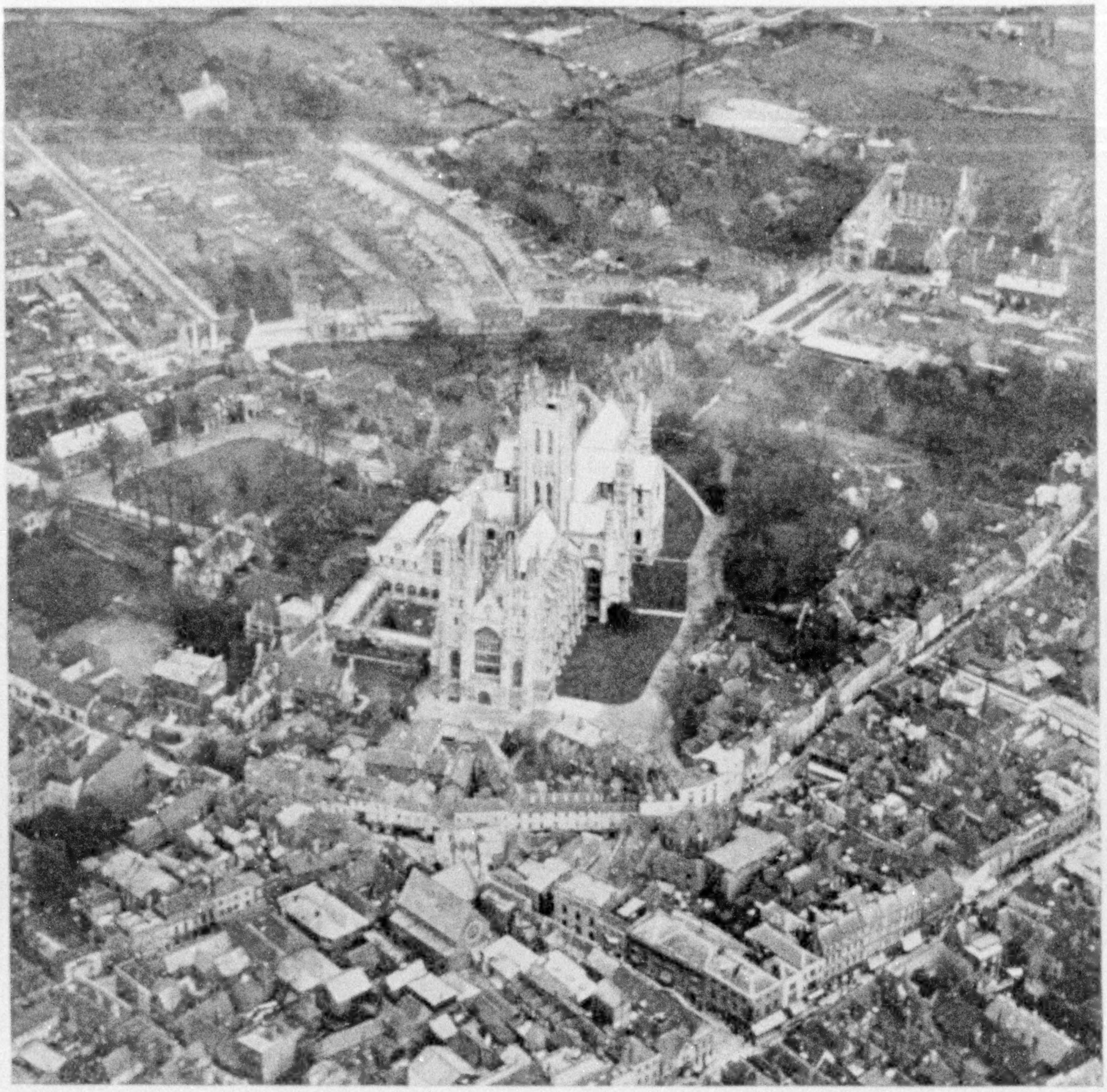
Note the sign on the roof of the railway station. There are now a number of cities in Europe and also in America which have painted markers on roof tops and prominent buildings to help the flyer identify his position. The Army Air Service in America has been active in promoting this service along the model airways which the War Department is establishing.

PLANE'S SHADOW SCAMPERS OVER CLOUD BANKS

With a sudden rush, the green fields far below were blotted out of sight, and a damp, gray mist enveloped us, a sense of floating in some dimly lit, enormous ocean cavern—then abruptly into brilliant sunshine again, while just beneath our wings, looking for all the world like a fresh-fallen field of snow, stretched the great mesa land of clouds.

Among the many wonders of flight, there is a special and peculiar enjoyment evoked by flying in clouds—a feeling both of arrogance and humbleness in thus prying into the infinite wonders of Nature's overhead workshop, a quickening of the sense of "the incommunicable and elusive excellence that haunts all beautiful things."

Our shadow, now faintly fringed with rainbow colors against the brilliant white surface just below, and prodigiously increased in size, scampered over the tum-



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CANTERBURY CATHEDRAL VIEWED FROM ABOVE

bled cloud layers with amazing speed, its nearness emphasizing the swiftness of our flight.

Through an unexpected rift in the woolpack, a patch of dark fields appeared beneath our wing and the word "Abbeville" became discernible, written in big white letters on the ground. This is one of the intermediate stations along the airway where supplies and shelter for the airmen are available. My companion reported our passage by radio and received from Abbeville a reply that we were invisible from the field.

The wind-scattered edges of the cloud bank faded behind us as the Cathedral of Beauvais came into view, casting long shadows in the fading light. Then Paris under a twilight glow, a tangle of red mansard roofs in the distance, with the Eiffel Tower and Sacré Cœur standing sentinel against the crimson sky. Le Bourget was at our feet. The pilot reeled in his wireless antenna and, with engines throttled, we came wheeling into the wind over the Customs building, the ground rushed up to meet us and skimmed by under our wheels, the tailskid settled easily onto the grassy turf and—*nous y sommes.*

"Have you anything to declare, *des cigarettes, du tabac?*" asked a bored-looking customs officer. *"Non? Eh bien, passez."*

And we are off for the Place de la Concorde in a big motor bus, tongues loosened as everyone exchanges impressions with his neighbor.

© Central Aërophoto Co.

THE CHALK CLIFFS AT BEACHY HEAD, BETWEEN BRIGHTON AND DOVER, SEEN FROM THE AIR

It is a remarkable fact that, with the thousands of airplane flights between London and the Continent, there are only two instances of planes being lost in the Channel. In one of these cases it is believed that the pilot was shot by an insane passenger, and regulations were thenceforth issued prohibiting passengers from riding in the cockpit with the pilot.

It is hard not to look down with a touch of conscious superiority on the jostling street throngs, tired workmen, who have trodden the dusty road of common tasks, hurrying home, while for us all the heavens have sung of liberty.

OFF TO TOULOUSE FOR A FLIGHT TO MOROCCO

Not many evenings later I boarded a night train at the Quai d'Orsay bound for southern France. The lights of the French capital were still glowing in the sky as I tumbled promptly into bed preparatory for an early rise in the morning.

It was shortly after 4 a. m. when the voluble conductor awakened me—the same whose palm I had crossed the previous evening to insure against any midnight intruders attempting to share my compartment. "For ways that are dark and devious," the French *wagon-lit* conductor has few superiors.

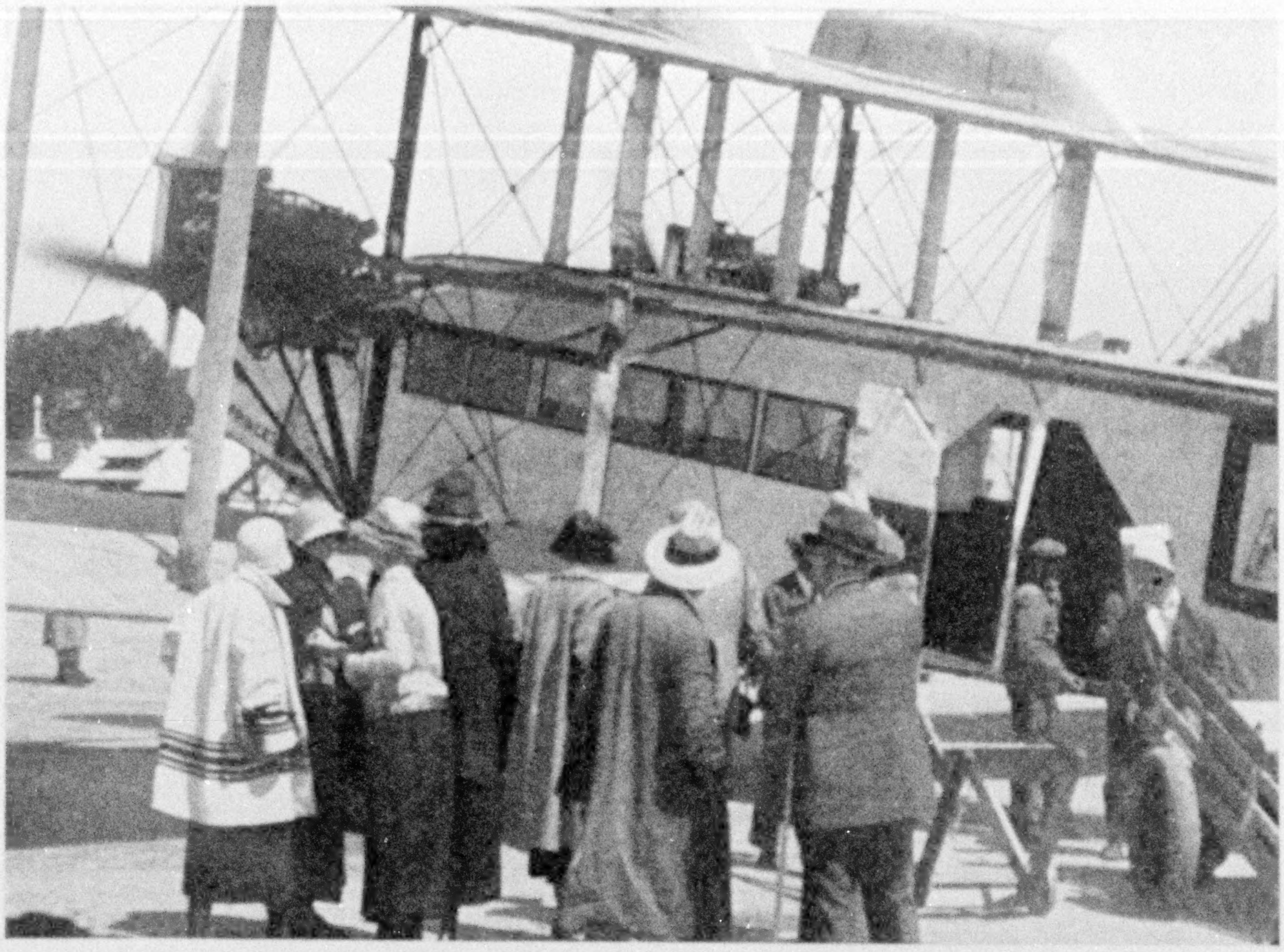
We were late rolling into Toulouse, the northern terminus of the French air line to Morocco, and although it was scarcely light, the local field manager was at the Gare du Midi awaiting us.

A few minutes at the Poste to collect the score or more of heavy mail sacks that had come down on the same train, and we were rattling over the cobblestones in the ubiquitous Ford toward the open fields.

The air port at Toulouse is the main repair and construction field for the entire Latécoère system, but there was no time this morning for even a hasty inspection.

A Breguet biplane was on the cement mat before the long row of hangars, its Renault engine idling. Upon our appearance a small group of mechanics precipitated themselves upon the mail, stowing the sacks in two large streamlined containers hung on either side of the landing wheels, beneath the lower wing.

A sleepy-looking *paysan* in a Customs



Photograph by Lieutenant J. Parker Van Zandt

PASSENGERS ARRIVING FROM LONDON AT THE PARIS TERMINAL AËRODROME, LE BOURGET

Most of these passengers are American tourists. This plane has seats for 12 passengers, with a luggage compartment in the rear, from which the mechanics may be seen unloading baggage and air express. The engines are 350-horsepower Rolls-Royce motors, such as were used in long-distance bombing planes during the war. On the upper wing may be seen the gasoline tanks, from which the fuel reaches the engines by gravity.

uniform made some hasty notes relating to my passport and declared impecuniosity, and I scrambled into the rear open cockpit as the pilot began to taxi slowly away from the buildings.

BEGINNING THE MOST MEMORABLE AIR RIDE IN EUROPE

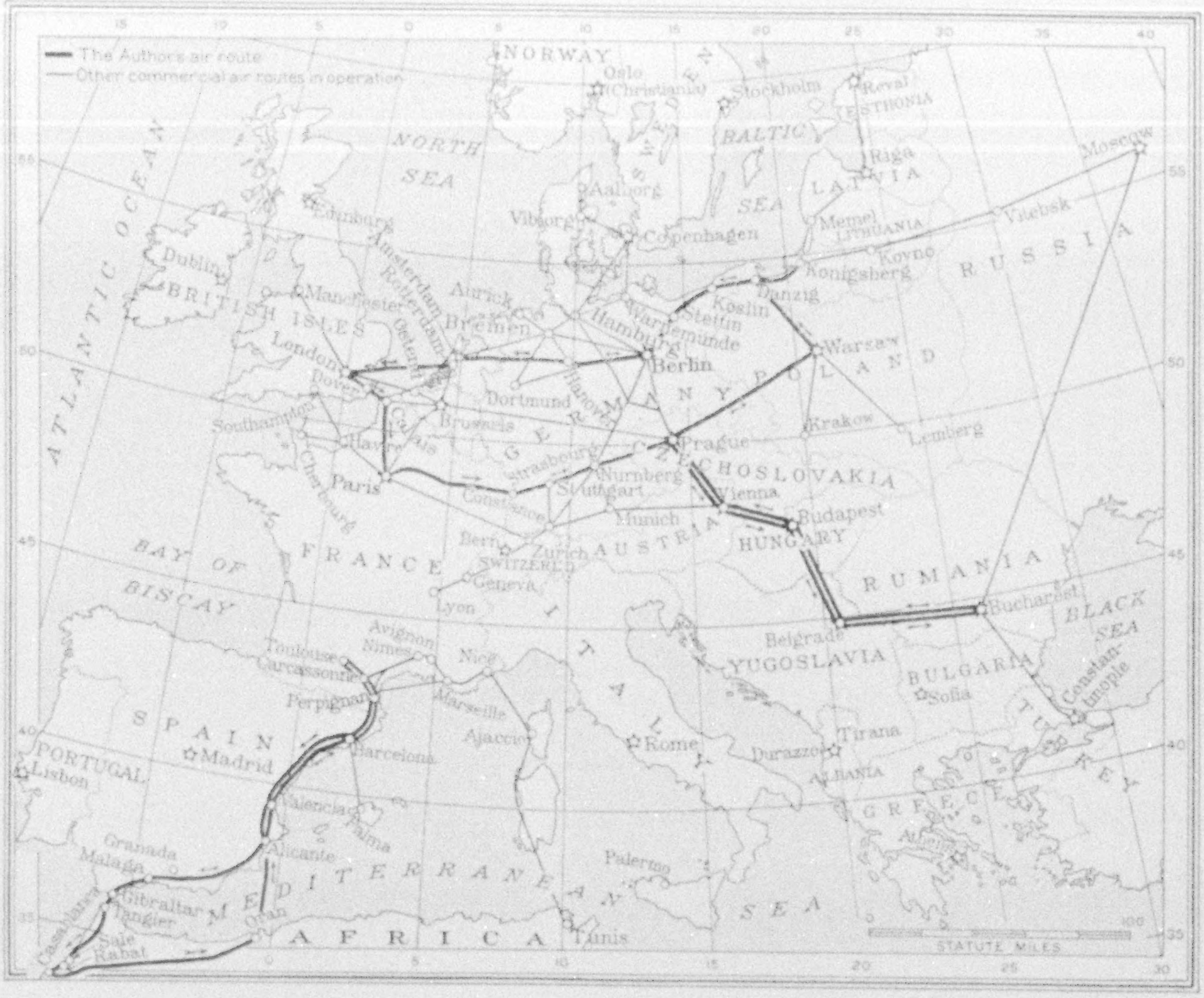
An answering roar from the engine as the throttle was advanced, wheels plowing through the deep dewladen grass, tail poised for flight—and I was off on what was destined to prove my most memorable air ride in Europe.

A wide turn over Toulouse, the street lights glowing dully through the ground mist. In the half-light of early morning the earth appeared dark and cold, and the crisp, clean rush of air past my uncovered cockpit made me thankful for the warm flying suit borrowed from a friendly mechanic at the field.

The gentle valley of the Garonne lay sleeping under a fleecy sheet of light fog, the apparent complete suspension of life evoking in some peculiar way a sense of special virtue in our own animation.

Like a child's ribbon, the canal lay curled at the base of the furrowed hills, a solemn double row of poplars guarding its banks. The black thread of the railroad now ran close beside it, now struck out boldly across the rich farm land toward where the valley narrowed before the encroaching Pyrénées.

A grayish mist across the narrow corridor warned us to descend to a lower altitude. The whistle of the flying wires rose to a shrill pitch, as we gathered momentum in the downward glide. Wisps of damp cloud flung by, and then a sudden opaqueness, as we plunged with noiseless impact into the threatening cloud front ahead.



Drawn by A. H. Bumstead

THE ROUTE FOLLOWED BY THE AUTHOR IN HIS 6,500-MILE AIRPLANE TOUR OF EUROPE

The cost of travel by air in Europe at present is not excessive and is roughly equivalent to first-class passenger travel by rail. The actual cost of air tickets for the total 6,500 miles was $380, or between five and six cents per air mile. It is to be remembered that the actual ground distance is in almost every instance considerably longer than the air distance involved. For the flight from Toulouse, France, to Spanish Morocco and return, the distance of 2,360 air miles is flown at a cost of $84, or at a rate of three and one-half cents per air mile. If the cost of sleeping accommodations and meals on trains or boats is included, the travel by air in many instances is actually more economical than first-class passage by any other means. The total flying time was 73 hours for the 6,500 miles, or an average speed of 89 miles. The two principal reasons for the low cost of this air tour were the generally favorable rate of exchange now prevailing and the government subsidies granted to the air lines, which cover a portion of the expense of operation.

In the damp semidarkness before me the glimmer of the radium-painted altitude indicator marked our steady descent from 300 meters to 200, 100—and then we were in the open again, with the dreaming farmhouses just beneath and the tall poplars reaching midway up to us.

Ahead looked unpromising. The crests of the hills crowding in on both sides were hidden in cloud, and the red-tiled roofs and yellow haystacks loomed up uncomfortably near, as we cautiously pursued the contour of the valley bed, marked by the canal.

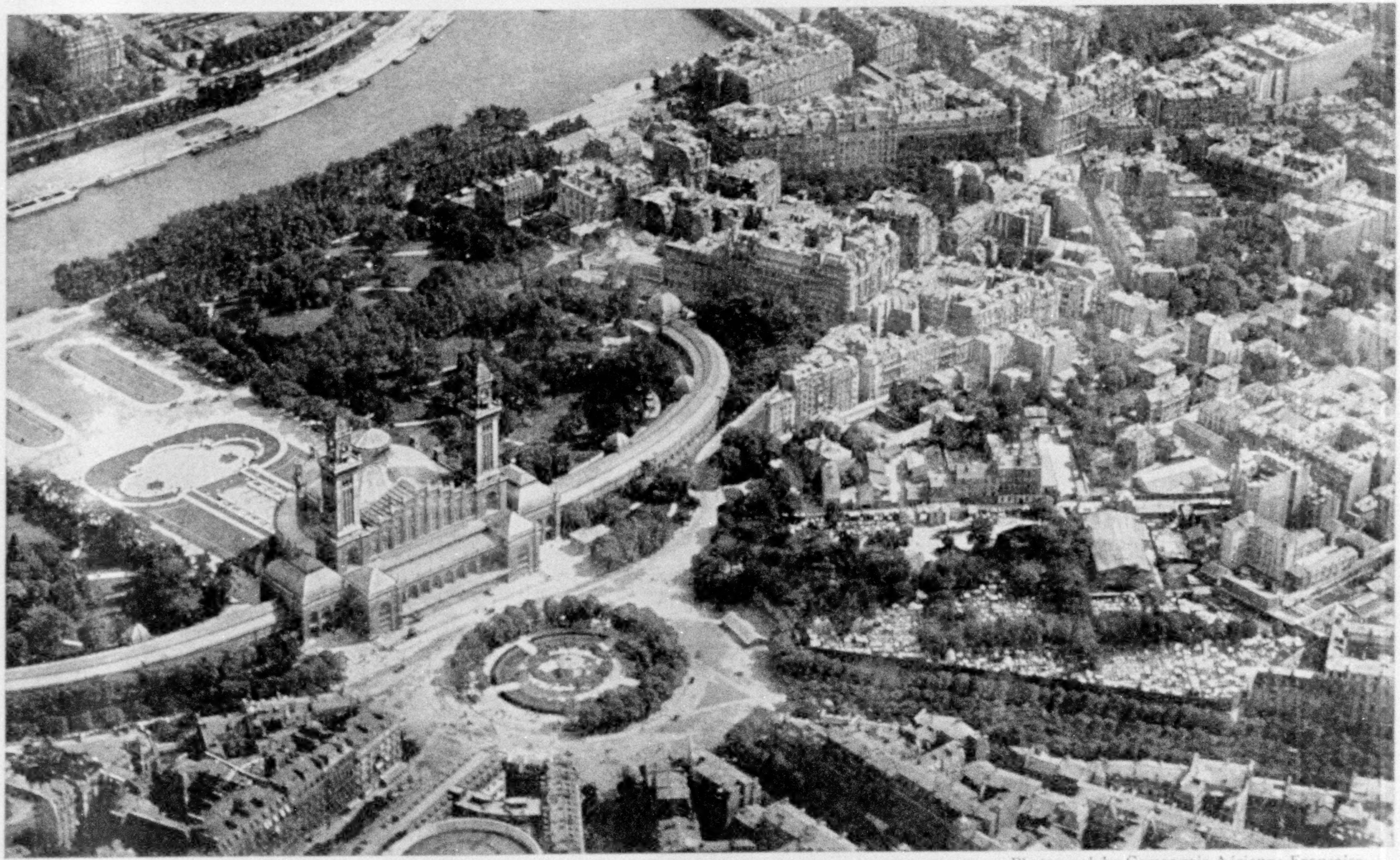
Pang! A drop of rain strikes my forehead and smarts like a hailstone. The damp, chill air penetrates through the flying suit and the lowering cloud just overhead shuts out the morning light.

A half hour passes. We dodge through a winding pass ahead, swing to the east again, and abruptly there opens before us a glorious picture of the breaking day. Still in shadowland, as from the mouth of a giant cavern, we gaze out under the

Photograph by U. S. Army Air Service

THE FAMOUS ARC DE TRIOMPHE: PARIS

France's Unknown Soldier rests beneath this arch. Captured German guns may be seen surrounding it. Shortly after the World War, a French flying ace flew a pursuit plane through this archway at a speed of 140 miles an hour. The clearance between his wing tips and the sides of the arch was less than six feet on either side. The slightest error of judgment would have meant utter disaster.



Photograph by Compagnie Aérienne Française

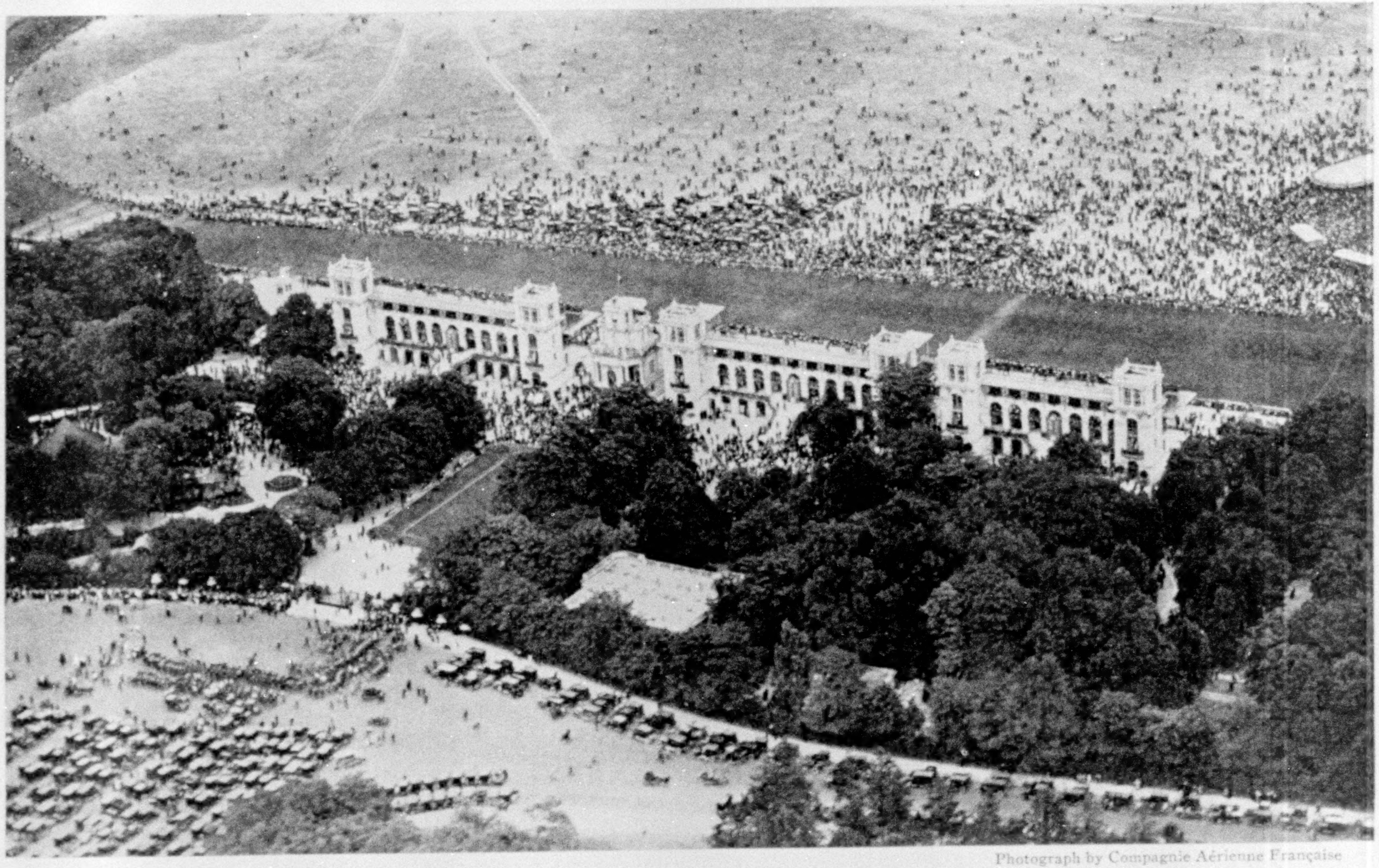
THE OUTSTRETCHED WINGS OF THE TROCADÉRO SEEN FROM THE AIR: PARIS

The central portion of this great museum building contains a festal hall having a seating capacity of 6,000. The two minarets, rising to a height of 230 feet, are conspicuous features of the Paris landscape. On the opposite bank of the Seine rises the Eiffel Tower.

Photograph by U. S. Army Air Service

THE JULY COLUMN, IN THE PLACE BASTILLE: PARIS

Rising on the site of the fourteenth-century castle which in time became the notorious prison and emblem of tyranny known as "the Bastille," this column of bronze commemorates not the destruction of the fortress at the beginning of the French Revolution, on July 14, 1789, but the heroes who fell in the revolution of July, 1830. In the right foreground is the St. Martin Canal, which beyond this point is vaulted over for a distance of a mile and a quarter and runs beneath the Boulevard Richard-Lenoir.



Photograph by Compagnie Aérienne Française

AN AIRPLANE VIEW OF THE LONGCHAMP RACE TRACK, IN THE BOIS DE BOULOGNE, ON THE DAY OF THE GRAND PRIX

The first race of the season, held at Longchamp early in April, is a fashionable fixture, when the new spring fashions of the Paris modistes are seen in all their glory. The Grand Prix, chief of the French races, is run on the last Sunday of June, inaugurating the summer season.

Photograph by Flandrin

TOULOUSE, ONE OF THE IMPORTANT CITIES OF SOUTHERN FRANCE, FROM WHICH THE FLIGHT TO MOROCCO BEGAN

The terminal flying field may be seen in the central background of the picture, marked by a prominent row of hangars along the railroad track. A number of Americans have studied at the University of Toulouse, and after the war special courses were given to Army officers. Note the numerous bridges across the Garonne.

black wedge of the storm lifted above us into the golden, sunlit country beyond.

Through some momentary, drifting cloud the low-lying sun sends forth long bars of alternate light and shade, like giant chariot spokes, as if to guide us in our eastward flight; and the whole countryside lies floating under a rising mist that covers the land with a transparent lavender veil. Such a glorious moment's careless rapture is worth "an age without a name."

ACROSS SPAIN ON A SACK OF MAIL

The walled city of Carcassonne slips by, sharply etched in light and shadow (see page 282), and the glistening waters of the Mediterranean appear ahead. As we swing by the eastern slopes of the Pyrénées, the clouds that had seemed so black and ominous overhead now appear snow-white, soft, vaporous, streaming south.

Perpignan lies in a fertile valley at the eastern foot of the Pyrénées, and here we make our first landing, one hour from Toulouse, to pick up the mail from Marseille. The connecting plane has arrived before us with another passenger, a young Frenchman with military clothing samples for his clients among the *fonctionnaires* at Rabat.

My comfortable chair is removed and replaced by a huge sack of mail; "*neuf kilos excédent*" of baggage is wedged in alongside; Monsieur, my new traveling companion, takes his place before me, while I mount solemnly on top of the mail sack, head and shoulders exposed to the wind. From such a vantage point, *en plein air*, I tour the length of the Spanish coast!

It is noon and we are approaching Alicante, 6,000 feet above a tangle of rocky slopes bordering the sea. Sun-baked white huts cling precariously to the ridges. Terraces, burnt dry, struggle up the hillsides. On our right the mountains rise sharply pointed, precipitous, gullies and pockets in their bare sides, patches of rough cultivation on their lower slopes. Dried river beds lie parched in the heat of the summer sun.

On our left the great bowl of the Mediterranean, green to deep indigo-blue along the rocky shore line, silver-gray on the shimmering horizon; a few toy fishing boats motionless on its placid surface.

The drowsy, friendly, comfortable purr of the engine which reaches us muffled by the cotton in our ears, and the deep drafts of cool fresh air have induced my companion to doze in the corner of the cockpit, his feet drawn up under him on top of packages of machine parts, the scarf about his neck waving languidly, like an ancient altar flame, in the eddies of wind above his bent head.

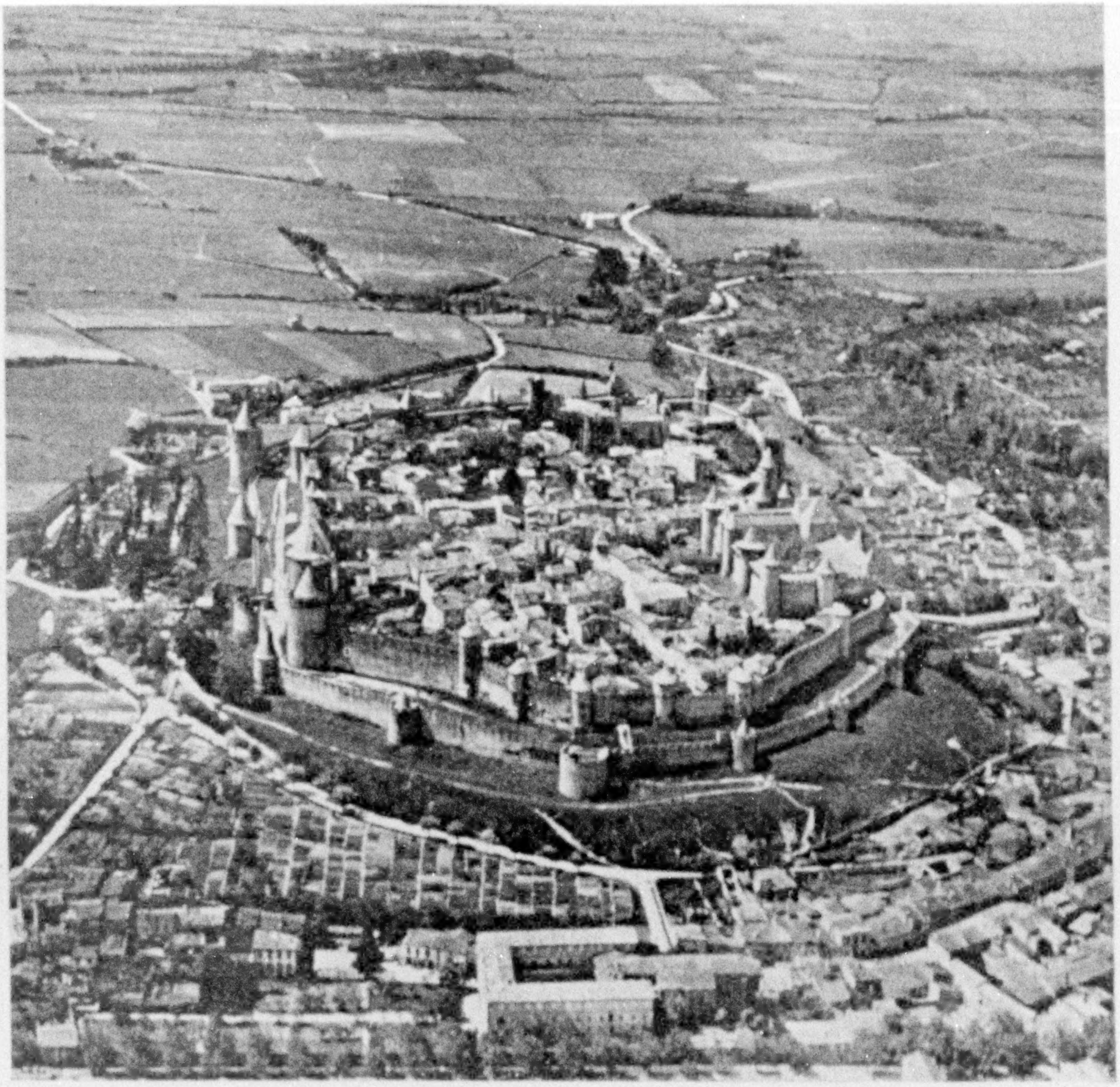
Barcelona, with its beautiful park, its monumental bull ring, its uncompleted Cathedral, is three hours behind us. Peñíscola, that extraordinary cluster of gray walls and white fishermen's huts clinging to a tiny rock thrown out like a button into the sea (see page 286), has faded into the distant haze. This is Spain, dry, sunburnt Spain, whose brown hills and relentless heat have burned themselves so indelibly into Spanish character. Valencia and its fertile valley lie forgotten to the rear (see page 289).

WE TRANSFER MAIL TO A PLANE BOUND FOR ALGERIA

Alicante at our feet, choking under a dense blanket of dust stirred up by the unbidden sirocco. The sirocco is as unwelcome in Spain as is the mistral in southern France.

We leave our cool height and glide down slowly, skim over a fence of rough piled stones, and settle to the earth, kicking up a great cloud of yellow dust behind us, as we taxi to the hangar. What a contrast with the cool green field at Toulouse a few hours earlier! Here the barren, sandy ground seems to seethe in heat and the air is thick with suspended dust.

No time for lunch. A cup of black Spanish coffee while the mail is being transferred to a waiting plane, a few pesetas to the sandaled, slatternly *femme de buvette*, and we are off, happy to rise quickly above the mantle of dust and breathe the clean air again. The hot wind off the bare hills clutches at the plane and tosses it angrily about, until we pass suddenly into the cool stratum above and make smoothly for the distant peaks of the Sierra Nevada (see page 292), far to the south.



Photograph by Flandrin

"THE WALLED CITY OF CARCASSONNE SLIPS BY, SHARPLY ETCHED IN LIGHT AND SHADOW" (SEE TEXT, PAGE 281)

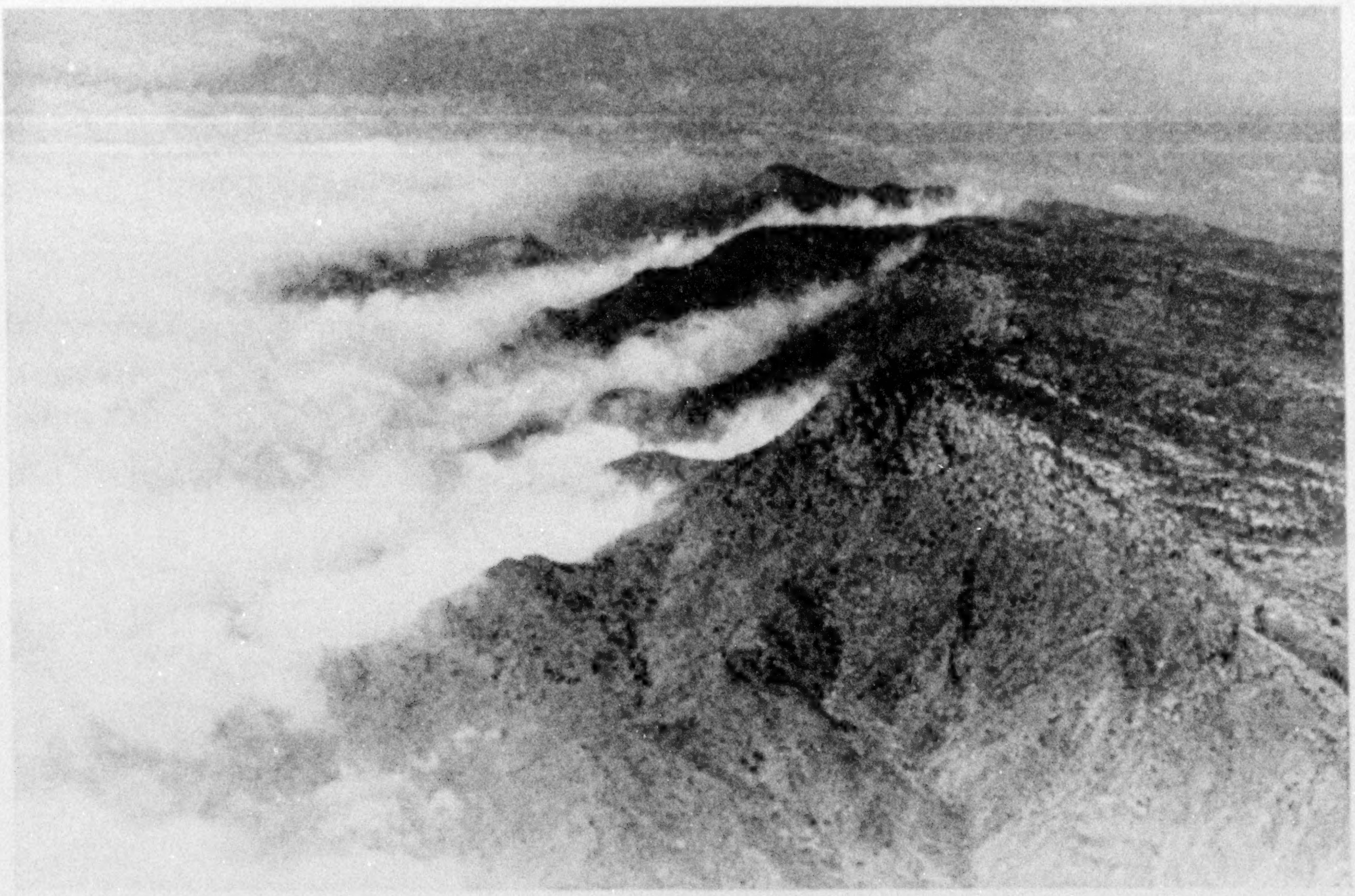
In 1849-79 the fortifications of the citadel were restored by the famous architect Viollet-le-Duc, who considered them the most perfect and picturesque examples in Europe of defensive works of the 11th-13th centuries.

Monsieur nudges me to note the sun-stricken fort and tiny harbor of Alicante, with the breakwater thrust out into the sea. As we watch, a seaplane takes off, bearing the mail for Algeria which we have brought from France. The following week, if all goes well, I will be returning from Oran, 200 miles across the blue Mediterranean, on that same hydroplane (see page 303).

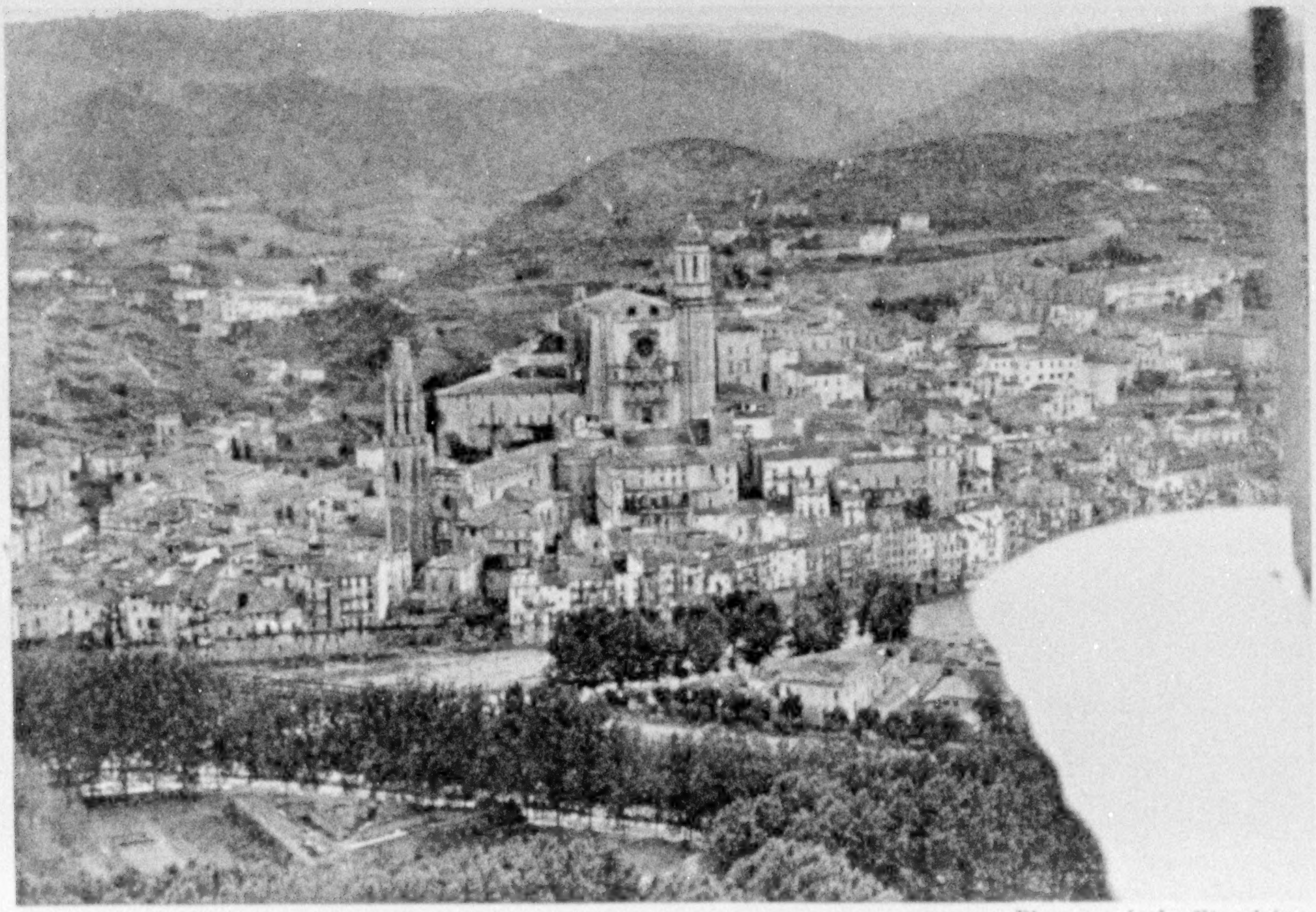
From somewhere among the packages under his feet, my companion produces a shoe-box, which he opens to reveal a *"déjeuner français, vin compris!"*

Here is good fortune, indeed; and 3,000 feet in the air we drink each other's health with red wine from a leaky folding cup, while the orange groves of Murcia slip away beneath and the sullen Sierra range unfolds in seemingly endless panorama ahead.

A snow-clad peak appears, dimly visible above its companions upon the horizon; two hours, and it has passed beneath us and lies indistinguishable among its neighbors, now far to the rear. Thus does air travel obliterate ancient barriers. Tiny white villages, like clustering flights of egrets, begin to dot the great brown slope rising up from the shore.



A STORM BREAKING OVER THE PYRÉNÉES NEAR PERPIGNAN (SEE PAGES 275 AND 281)



Photographs by Flandrin

AN AIRPLANE VIEW OF GERONA, SPAIN, BETWEEN PERPIGNAN AND BARCELONA

The conspicuous building in the middle distance, with only one of its octagonal towers completed, is the city's Gothic cathedral, begun in 1312. Gerona boasts of one of the most heroic defenses of history, when, in 1809, a small Spanish garrison, aided by a handful of English volunteers, withstood a French army of 35,000 for seven months. The French lost 15,000 men before the fortifications whose ruins still crown the encircling heights.

Photograph by Flandrin

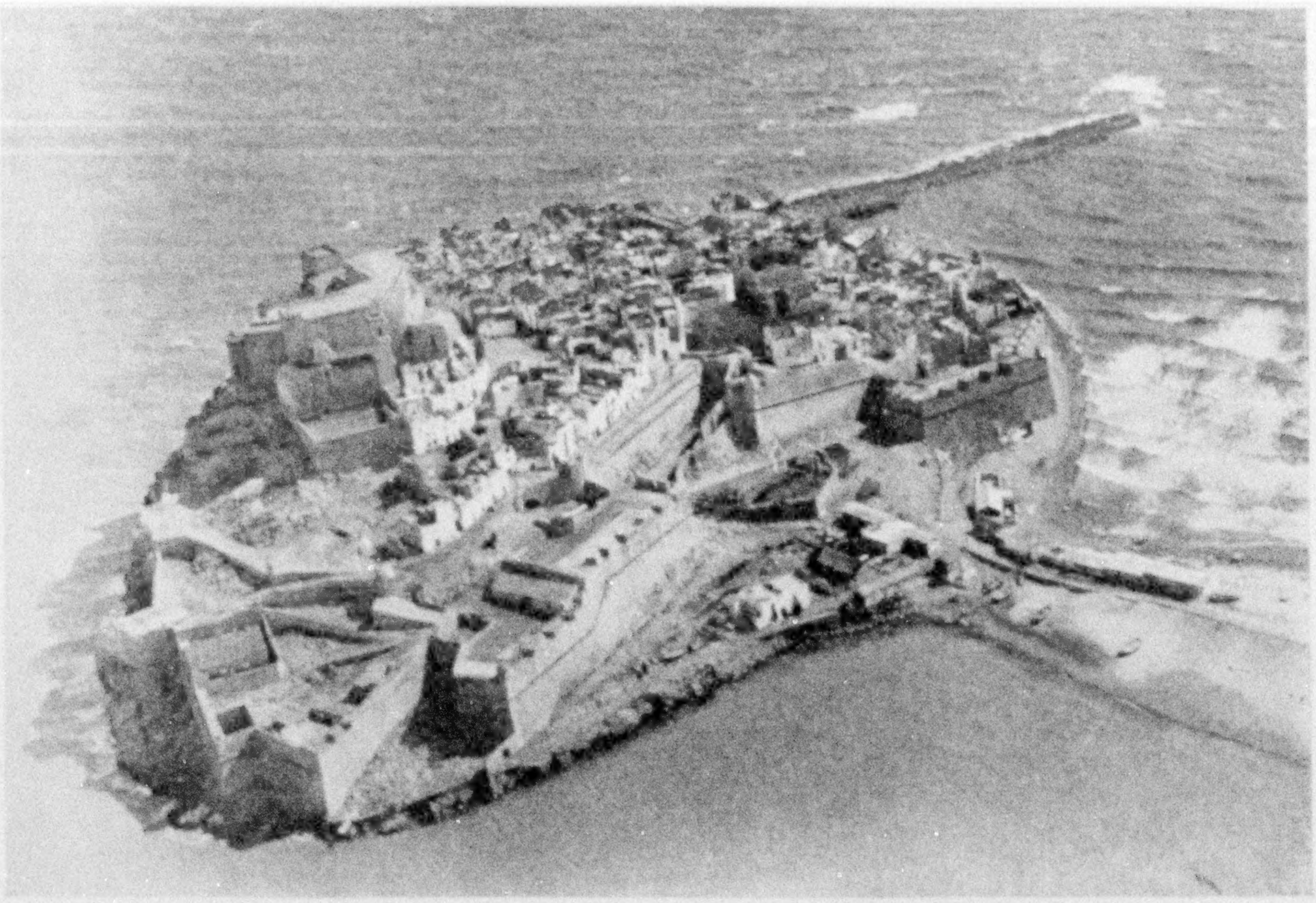
AN AIR VIEW OF BARCELONA, SECOND CITY OF SPAIN

This great seaport seems more closely related in spirit to the French port of Marseille than to the Spanish cities in the south. There are many beautiful residences on the foothills surrounding the city.

Photograph by Flandrin

THE CITY AND HARBOR OF TARRAGONA, SPAIN

The bull ring (near the middle of the picture) is a conspicuous landmark of almost every Spanish city of importance. It is in Tarragona that the celebrated liqueur of the Grande Chartreuse has been manufactured since 1904, when the monks of Grenoble were forced to leave France.



Photograph by Flandrin

"THE GIBRALTAR OF VALENCIA"

One of the most remarkable natural curiosities along the eastern Spanish coast is Peñíscola, a little fishing village on a rock out in the Mediterranean several hundred yards from the coast and joined to it only by a low, narrow sandy strip. It is the more extraordinary because in this region the shore line is quite straight and regular and the hills have receded to some distance from the sea. This stronghold was wrested from the Moors by Jaime I of Aragón in 1233. It was the residence of Benedict XIII, antipope, with his cardinals, after the Council of Constance deposed him, in 1417.

A group of fishermen's huts appears at the foot of the cliffs, where a welcome beach affords a possible *terrain de secours*, should our faithful motor fail us. The tiny white ribbon of a road creeps along the face of a rocky cliff, hot and panting under the flooding sunlight, until it finds brief respite in a shadowy tunnel.

ALHAMBRA PALACE A HALF HOUR'S FLIGHT TO THE RIGHT

Our new pilot, who joined us at Alicante, is a tall, vigorous-appearing Corsican with leathery skin, tremendous hooked nose, and dark, flashing eyes. He points to the jumbled hills thousands of feet below, pulls his nose, makes a wry face, and shakes his finger disparagingly. The tanned kerchief about his neck whips in the breeze; the silken sock which he wears for a helmet is much the worse for constant exposure to grease and oil; and his sharp eyes face the wind without the protection of goggles.

A valley opens out and Málaga appears, a welcome sight after four hours.* It is hot on the ground, and tropical palms, their fronds gray with dust, border the field. Up this valley a brief, cool half hour by air—and most of a disagreeable day by Spanish train—lies Alhambra Palace on its wooded hill, Granada at its feet (see page 294); and sometimes, when the wind is right, the pilot lays his course that way, deserting the shore line for the inland route.

But such was not our good fortune. In 10 minutes we have transferred to a new plane, and with another pilot are off down the coast, the lower contours flattening out as we rise above them.

Here at last the long Spanish coast ends at the Strait of Gibraltar, culminating in that strange, formidable outthrust of the earth named after a long-dead Moor

* See also "From Granada to Gibraltar—a Tour of Southern Spain," by Harry A. McBride, in The Geographic for August, 1924.

(Tarik). The wind sweeps through the narrow strait, scattering sudden flashes of white foam in the Mediterranean blue, like fireflies against a twilight sky, while beyond lies Ceuta on the Moorish coast, with the highest peak of its headland, the African "Pillar of Hercules," standing out menacing, portentous (see page 298).

SKIRTING THE AFRICAN COAST UNDER A PITILESS SUN

The international port of Tangier beneath our wings, white, flat-roofed houses rising above each other in tiers of cubes, a solitary minaret jutting into the air, a gray line marking the trace of ancient battlements, Portuguese or English.

To our left lie the Riff hills, where Spain is vainly bleeding herself to death; before us, brown, burnt, and dead, the wide, rolling world of the Bled, the Moroccan veldt; on our right, the restless blue of the Atlantic. This is the East, bright and shining as a sword, under a pitiless sun.

Here and there, on the lone, treeless plain, are flocks of Berber sheep, conical huts of the *indigènes*, and the clustered black tents of nomads. We skirt the African coast, where Phœnician, and, later, Portuguese caravels crept cautiously southward.

The heat at this hour of the day, even at 2,000 feet, is stifling. From my exposed perch on the sack of mail, the blast from the propeller is like that from the opened grate of a furnace; impossible to look westward, toward the burnished sun low on the horizon.

I crouch down to find shelter in the shadow of the cockpit, but the oppressive air seeps up and stifles with its stagnant warmth.

Our pilot descends to a few hundred feet above the Bled, where it is surprisingly cooler. The white-dovelike glitter of an Arab town appears by the blue rim of the Atlantic, the plunging breakers crashing soundlessly at its feet. Forlorn processions of camels move along the dusty trails; an astonished Moor, wrapped in loose, voluminous robes, looks up from his ambling mule.

Then Salé (Salli) of a dazzling whiteness, ancient home of the "Sally Rovers," and Rabat-el-Fath, the Imperial City, on the banks of the Bu Regreg, winding down to meet the blue of the ocean under high cliffs, through a brown-velvet valley (see illustration, page 300).

As we glide down over the Residency, the sun slips at last behind the low, banked clouds on the horizon, in gray mist and secret splashes of fire, and the red cliffs across "The Father of Glittering" are reflected like a flame in the river.

Here Monsieur, my traveling companion, bids me bon voyage and crawls stiffly over the side of the fuselage; my sack of mail yields its place to a comfortable chair, and the pilot and I are off in the closing hour of the day for our final hop.

THREE CIVILIZATIONS PASSED IN REVIEW IN 15 HOURS

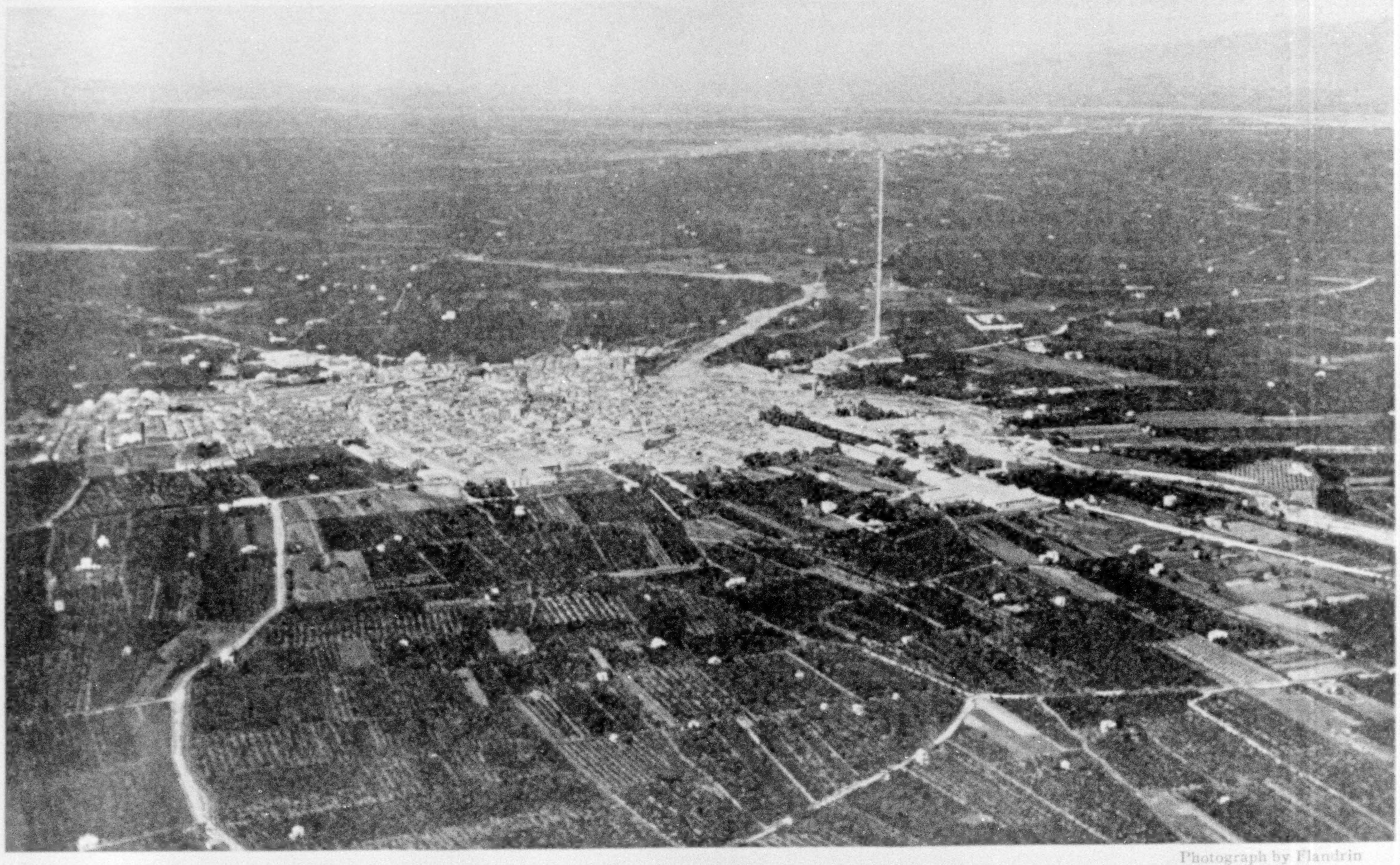
The blinding light of the afternoon has given way to a velvet softness. The rolling Bled upon the Atlantic still lies burnt and brown, but there is more water here in the occasional meandering stream than in the sun-baked arroyos of Spain.

Roused by the roar of our engine, great storks rise leisurely before us and wing their way across a marsh, a study in black and white. At a bare 100 feet of altitude, we skim over a low stone wall, behind which an imperturbable, worm-eaten camel stalks languidly round and round a water wheel. Here are the squalor and simplicity of primitive life in a land burnt dry by an African sun.

Little native donkeys appear almost invisible under their heavy loads; an ass and a camel march slowly along together; in the distant eastern haze are the foothills of the High Atlas Mountains, forbidding refuge of the dissident Berber tribes, the *insoumis*.

The pilot dips down suddenly to a few feet above the broad Atlantic beach, and, with wheels almost touching the sand, we skim south, dunes flying by our wing tip, the pungent salt air of the crashing waves filling our nostrils. Thus we rush suddenly upon Casablanca, zooming up over the artificial harbor, across the white and yellow houses and ocher-tinted towers, and come at length to rest upon the flying field beside a military camp (see pages 301 and 302).

In the cool of the evening I wander through the narrow, winding streets within the walls of the old Moorish



Photograph by Flandrin

VILLAREAL AND ITS ELBOW-TOUCHING SISTER TOWN OF ALMAZORA (IN THE BACKGROUND)

Oranges are one of the products for which Spain is noted and these two towns, between Tarragona and Valencia, are in the center of one of the most productive orange-growing valleys in eastern Spain.

Photograph by Flandrin

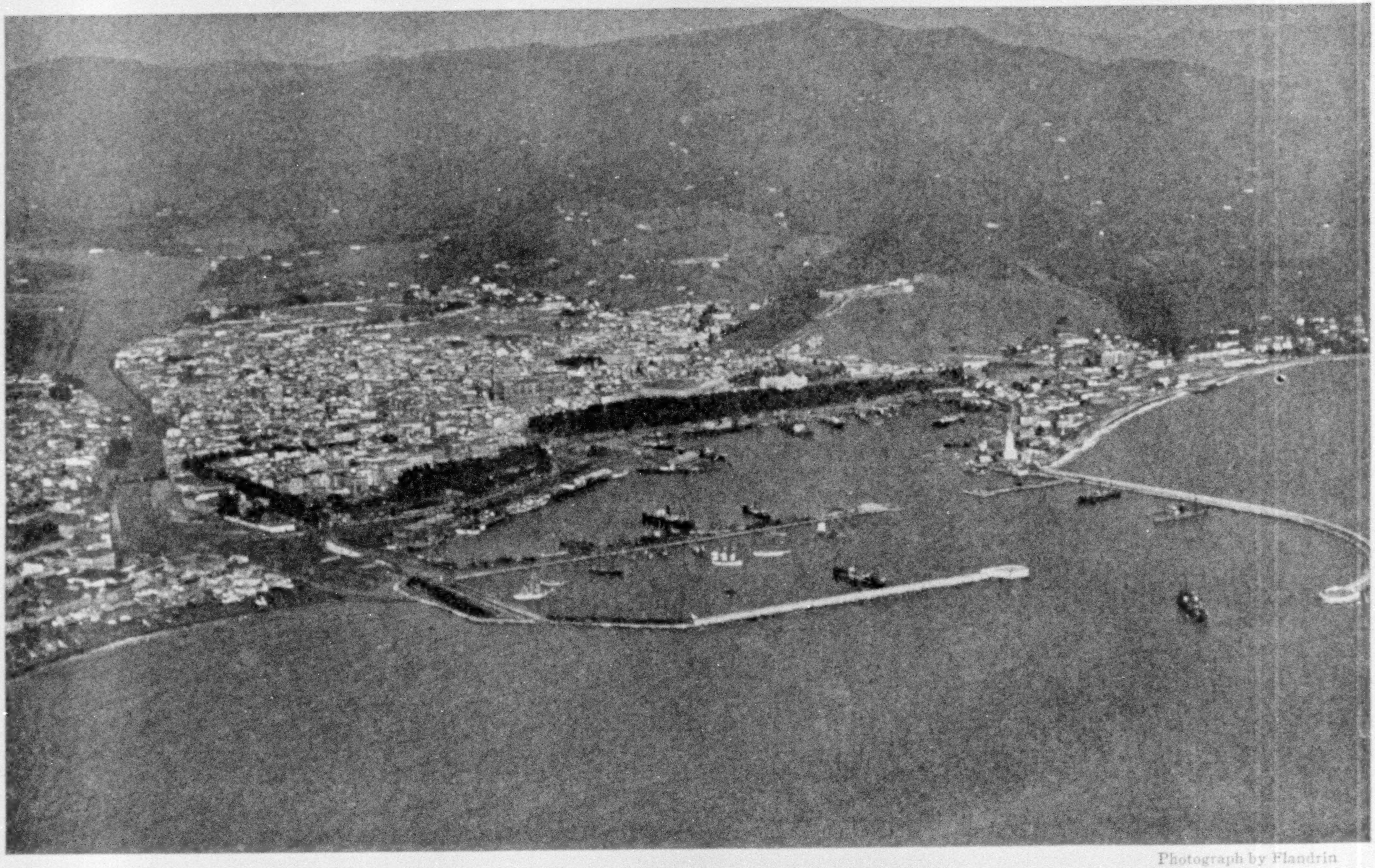
A BIRD'S-EYE VIEW OF VALENCIA, LYING IN A FERTILE VALLEY TWO AND A HALF MILES FROM THE MEDITERRANEAN

"You would take it for a piece of heaven upon earth," is the phrase used by the ancients to describe this picturesque and thriving city, which ranks next to Madrid and Barcelona among Spanish municipalities. Valencia was the scene of that favorite episode of Spanish ballad makers, when the Cid, "after his death," led his army against the Moors and achieved an overwhelming victory. The story is told in the eleventh book of Southey's "Chronicle of the Cid."

Photograph by Flandrin

THE HARBOR OF ALICANTE: SPAIN

The landing field is on the level plateau behind the city, while the seaplanes plying between this port and Oran, on the coast of Algeria (French territory), anchor in and take off from the harbor. The Spanish Government has not taken a sympathetic attitude toward the development of the French air line across its territory to Africa, and at present neither mail nor goods are permitted to be delivered in or taken out of Spain by air. The company, in fact, cannot ship by air spare parts which it may urgently require and for which it may have room upon its plane, but must send them to its intermediate fields in Spain by the usual slow methods of rail transportation.



Photograph by Flandrin

THE HARBOR OF MÁLAGA, AT THE FOOT OF THE SIERRA NEVADA

To the northeast, a distance of a cool half hour by air and a disagreeable day by Spanish train, lies Alhambra Palace on its wooded hill (see page 294). Sometimes, when the wind is right, the airplane pilot lays his course that way, deserting the shore line for the inland route.

Photograph by Flandrin

THE CORRUGATED FOOTHILLS OF THE SIERRA NEVADA ALONG THE SOUTHEAST COAST OF SPAIN

These hills are very rough and uninviting in many places and offer few opportunities for a safe landing, in case the motor of the airplane should fail. The pilots generally follow the shore closely, depending on occasional open beaches to afford a welcome emergency field when occasion requires.

quarter, the courteous *chef de l'Aérodrome* as my guide. Veiled women slip noiselessly past, an indolent Moor in scrupulously white garments goes by astride his donkey, a half-naked water-carrier staggers under the swelling goat-skin flask across his loins.

Here is the age-old, immemorial life of the East, a page out of the thousand and second tale of Scheherazade. Yet this very morning, a brief 15 hours before, I was 1,200 miles to the north, across the length of Spain, engulfed in the tumult of a European city. By the hazard of travel, the contrasts of a score of centuries have been compressed into those 15 hours; three civilizations passed in review, made luminous and dramatized from the strategic crow's nest of flight.

FROM PRAGUE TO BUCHAREST IN A DAY

There were eight of us who sat in the crowded bus of the "Compagnie Franco-Roumaine de Navigation Aérienne" on an early August morning, as it pulled up the long hill out of Prague to the military aërodrome on the plain commanding the Vltava (Moldau) Valley. Of my traveling companions one was a Frenchman en route, as I, from Paris to Bucharest; the rest were Americans destined for Vienna—a group of college students and a young man from Boston traveling with his mother.

Two days before I had come from Paris in a Spad plane with a Czechoslovakian for company, and several hundred pounds of silks and perfumes bound for the Balkan capitals. For four hours on that trip we had flown across German territory, where a forced landing would have resulted in the confiscation of the plane and goods and the pilot doubtless thrown into jail.

France and Germany are still very much at cross-purposes regarding aviation. Germany, smarting at the extension of the Versailles Treaty clauses

Photograph by Flandrin

A THIN WHITE LINE OF HIGHWAY THREADING THE SUN-SCORCHED HEIGHTS OF SPAIN (SEE PAGE 286)

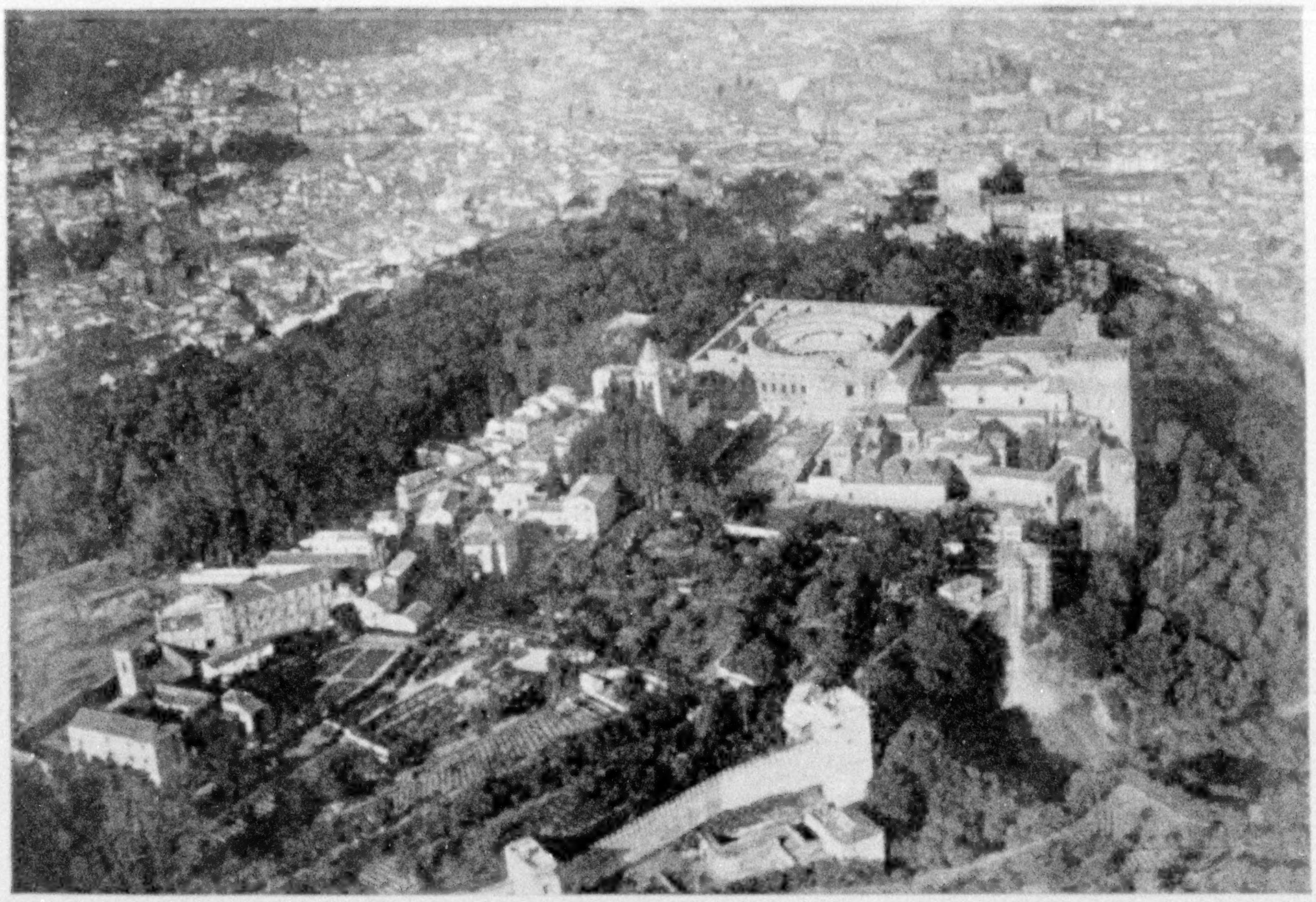
Where the mountains approach the Mediterranean shore the highway with difficulty cuts a tortuous path through the forbidding rocks. The generally arid and rugged character of southeastern Spain is deeply impressed on one by a flight along the coast.

which restrict its manufacture of aircraft, refuses authority to other nationals to fly across its borders, while France blithely continues to operate its air line between Strasbourg and Prague, trusting to careful management and a reliable engine to keep its equipment out of German hands.

This is a bitter legacy of the World War, a regrettable schism that only serves to aggravate international misunderstanding; but for those of us only momentarily involved, it appeared as an additional element of adventure, adding zest to our flight.

The many miles of the Black Forest crowding the German hills were still fresh in my memory, as were the softer slopes of the Vosges and the battle scars in the rich earth of the St. Mihiel salient, still obdurate before the patient reclamation of the French peasant's plow. The old imperial road leading through the Atlas Mountains to the orange groves of Algeria, which had been spread out beneath my winged observation platform but a few days before, now seemed a thousand leagues away.

It was hard to tear oneself away so



Photograph by Flandrin

AS AN AIRMAN SEES ALHAMBRA PALACE AT GRANADA, ONE OF THE PRICELESS CONTRIBUTIONS OF THE MOORS TO EUROPEAN ARCHITECTURE

The Moorish palace is to the right of the great arenalike structure (the Palace of Charles V) in the middle distance.

early from the quaint old city of Prague, redolent with the history and tradition of the ancient kingdom of Bohemia, of which the Czechoslovak Republic is the modern revival.

REGISTERED VOTERS ARE OBLIGED TO VOTE IN CZECHOSLOVAKIA

The frowning bulwark of the Hradčany, or Royal Castle, looks down across the green islets of the wide Vltava to the strange houses along the left bank, where the fusion of Italian baroque with the splendor of the Middle Ages captivates the eye. In this rich medieval atmosphere young Bohemia is hard at work building up one of the most progressive of modern democracies.*

In Czechoslovakia everyone entered upon the list of voters is obliged by law to vote, under penalty of fine or imprisonment, and the suffrage draws no distinction between race or sex, religion or station in life.

The Czechs are an industrious, progressive race, and for this reason, as much as any other, are not greatly loved by some of their more easy-going neighbors.

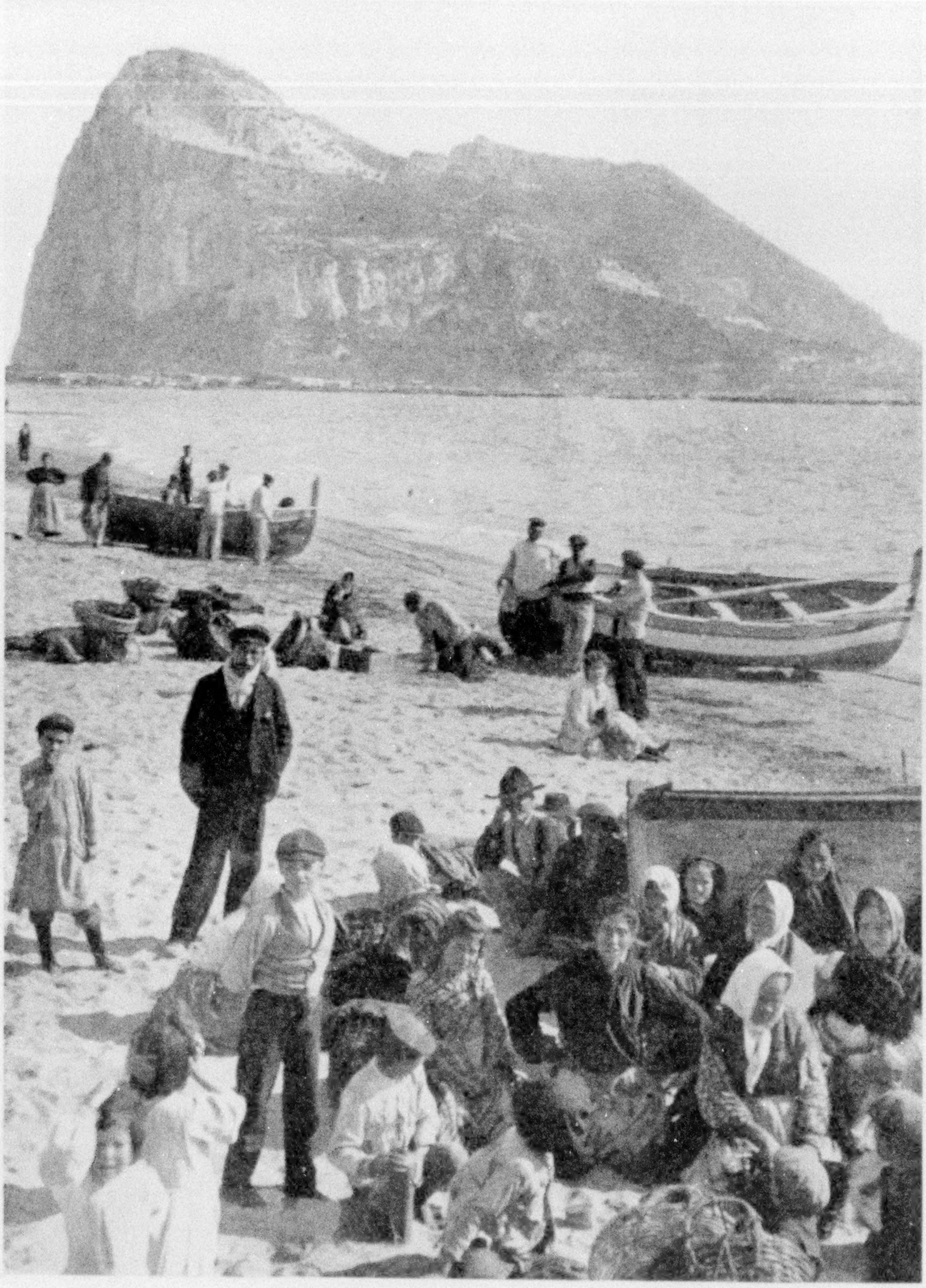
It is an interesting fact that the screw propeller, an essential element of the airplane which was to carry me swiftly across Bohemia this morning, was the invention of a son of a Czech customs official in Trieste, more than 100 years ago.

At the aërodrome we found two Spad planes waiting, as there were too many of us to accommodate in the usual one plane.

These winged carriers of the Franco-Roumaine are not the most comfortable of the modern European passenger planes, but they make up in part for their cramped quarters by cruising at a higher speed than the more commodious liners in use between London and the Continent.

The rounded semicylindrical body of

* See, also, "Czechoslovakia, Key-Land to Central Europe," by Maynard Owen Williams, in THE GEOGRAPHIC for February, 1921.



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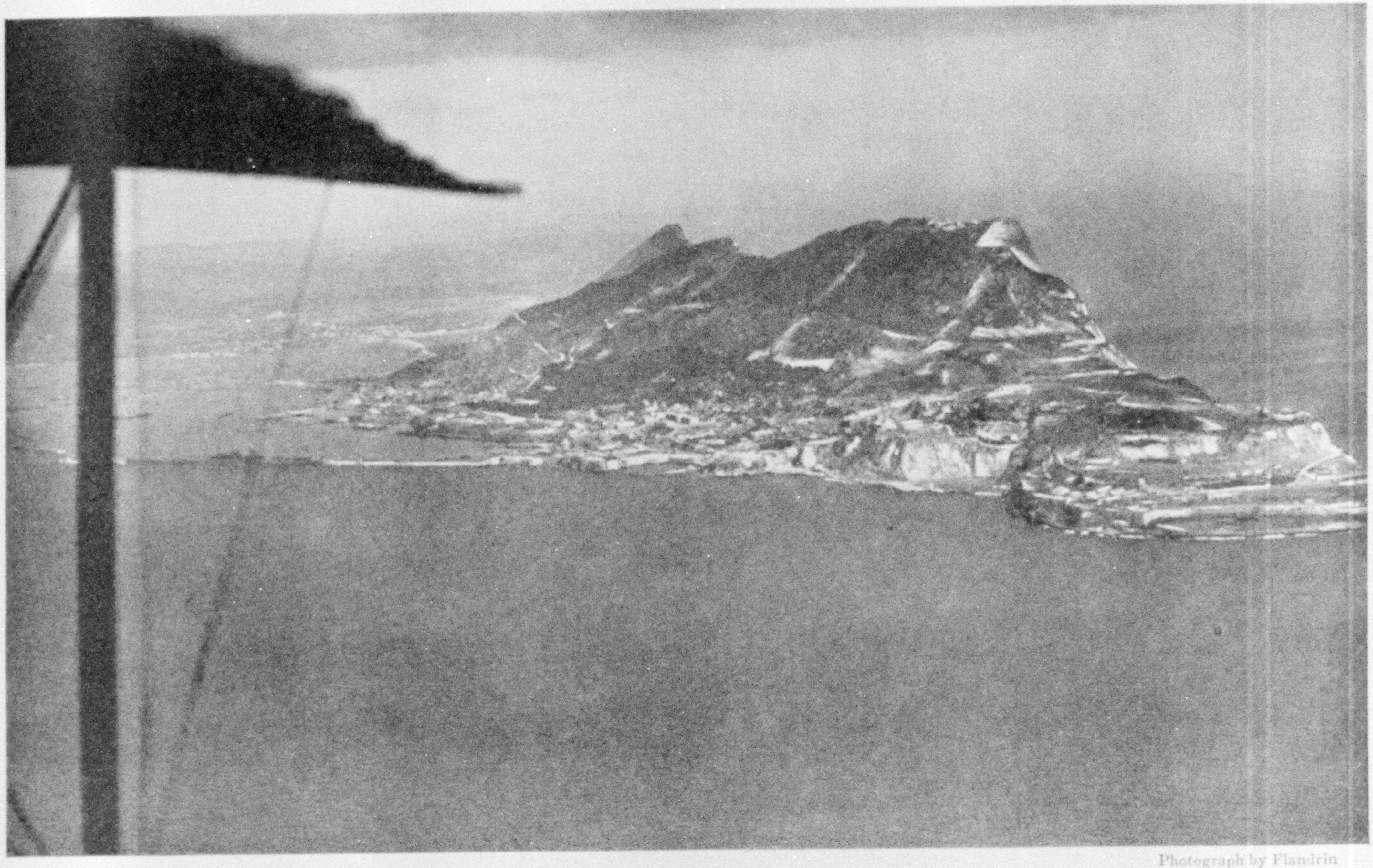
GIBRALTAR, SEEN FROM THE NORTH

This is the familiar view of the great rock upon which Great Britain stands guard over the entrance to the Mediterranean (see also illustration, page 296).



Photograph by Flandrin

THE ROCK AND CITY OF GIBRALTAR AS IT APPEARED ON THE FLIGHT BETWEEN MÁLAGA AND TANGIER

The tiny strip of open neutral territory between British and Spanish land may be seen in the central background. For a detailed illustrated description of Gibraltar, see THE GEOGRAPHIC for August, 1924. One wing of the plane from which this photograph was made is visible at the left.

Photograph by Flandrin

THE INTERNATIONAL PORT OF TANGIER (SEE PAGE 287)

In the background may be seen the Riff hills, where Spain and the rebel Berbers have been engaged in conflict for many years. (See, also, the article by Harriet Chalmers Adams in this number of THE GEOGRAPHIC.)

Photograph by Flandrin

OVER CEUTA, IN SPANISH MOROCCO, AND THE SHORE LINE ALONG THE STRAIT OF GIBRALTAR (SEE TEXT, PAGE 287)

The strait between Europa Point and Ceuta is 12½ miles wide and the crossing by airplane consumes but a few minutes, as compared to a two-hour trip by boat.

the Spad has a closed compartment immediately behind the 400-horsepower Lorraine Dietrich engine, where three or four passengers may sit comfortably, if too many packages of goods of every variety are not being transported at the same time.

More modern planes now provide a separate compartment for commodities, with resulting increased comfort to the air traveler. In the rear of the passenger section are two cockpits, one for the pilot and the other for a mechanic.

By dint of much well-intentioned French with the field manager, who sat beside me in the bus during the ride out to the aërodrome, I was successful in getting this second cockpit allotted to me; so that a short half hour later, when we swept across the field and out over the Vltava Valley, I had the advantage of a vision of the surrounding country as unrestricted as that of the pilot close by my side.

THE BOHEMIAN COUNTRYSIDE IS A COLORFUL MOSAIC

One hundred and eighty-five miles across some of the most fertile farm land in central Europe, lay Vienna. In less than two hours we were there—two golden hours crowded with a kaleidoscopic succession of scenes and vistas that not even the master brush of a Corot could rival. If the long flight across Spain to Africa was the most spectacular, surely this all-too-brief trip across Bohemia was the most charming of my aërial travels in Europe.

Overhead, a flawless blue sky, like the image of a serene conscience; below, a marvelous mosaic of cultivated farms in all the ravishing colors of the harvest season. And such an infinite variety of patterns! Dark green-and-purple forest patches standing groomed and orderly; long, narrow, undulating strips of alternating green and gold and brown—new growth, ripening grain, and fresh, upturned earth; a score of greens; delicate shades of henna and silver-fox; gray and blue flashes of water; the white ribbons of roads lost for a moment in the cool shade of timber; tiny teams of oxen on the crest of a slope—while over all the dominant color theme of gold, the gold of the harvest.

It is little wonder that Bohemian character developed, in such a friendly environment.

With real regret I saw ahead the glistening Danube winding off through heavy woods toward Bavaria; then the pilot was calling my attention to a castle just below us. It was the famous castle of Kreuzenstein, set upon a knoll dominating the neighboring countryside, its moat now velvet-green, its battlements upflung in seeming challenge to the indifference of a flying age—a proud symbol of a cruel and chivalrous past.

There came flooding back all my boyhood memories of "Graustark" and "Men of Iron," and I was still lost in reverie when we glided down for a landing at the Aspern field.

PILOT ACTS AS GUIDE, USING PENCILED NOTES

In 20 minutes we were off with a new plane and pilot for Budapest. A heavy-jowled Hungarian, who had taken the place of the Americans who bade us good-bye at Vienna, shared the small compartment of the Potez plane with the Frenchman, who had come from Prague, and myself.

With true French courtesy, our pilot had thoughtfully prepared a scholarly typewritten description of the route, which was mounted on the bulkhead before us, and, together with a roll map case with which we had been provided, it served to shorten the 150 miles that separated us from the Hungarian capital.

As we passed over the old Roman arenas and the châteaux, our genial pilot would shake the plane controls to attract our attention, and several times during the hour and a half he thrust brief penciled notes of comment through the sliding window behind our heads.

But the first glow of the day's enthusiasm was gone, and, even with the pilot's energetic coöperation, could not be recaptured. My spirit was hovering above the Moravian Hills and refused to respond to the unimpressive vista of the broad and level Danube Valley, the yellow tide of the Donau Strom meandering between wooded, uncertain banks.

"A moitié chemin," read the pilot's note, and ahead we made out Komorn, a city half Czech and half Hungarian, at

Photograph by Flandrin

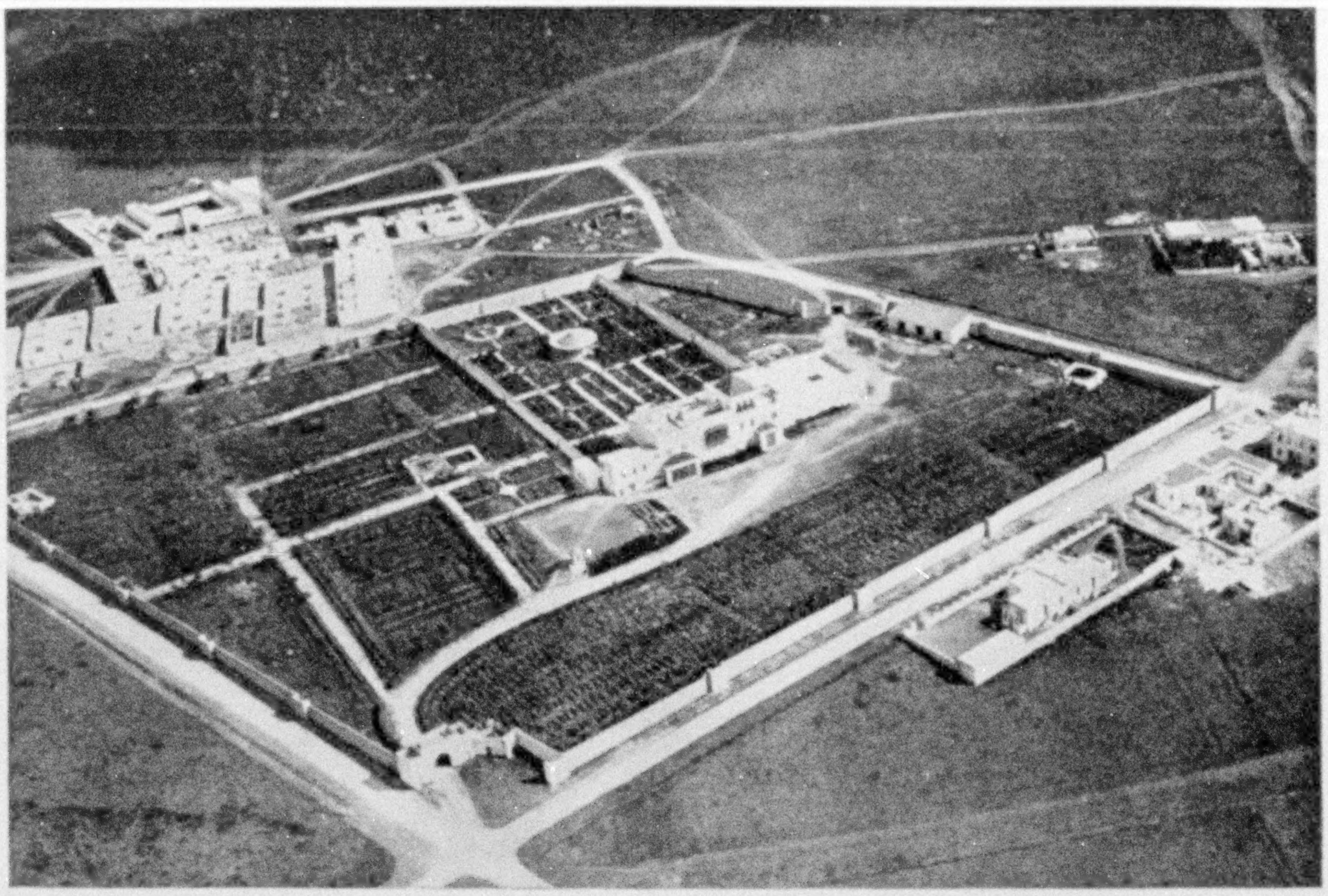
RABAT TO THE LEFT, WITH SALÉ, ACROSS THE BU REGREG, TO THE RIGHT (SEE TEXT, PAGE 287)

Rabat is the chief industrial center of Morocco, carrying on trade with Fez and the interior, with Gibraltar, Marseille, London, and Manchester, and is the official home of French control in Morocco. It was founded in 1184, at which time Salé was already an ancient city.

Photograph courtesy Lignes Aériennes Latécoère

AN AËRIAL VIEW OF CASABLANCA: MOROCCO

"We rush suddenly upon Casablanca, zooming up over the artificial harbor, across the white and yellow houses and ocher-tinted towers. . . . Here is the age-old, immemorial life of the East, a page out of the thousand and second tale of Scheherazade" (see text, page 287). Casablanca was built by the Portuguese, during the latter half of the 15th century, on the site of the once prosperous town of Anfa. Native uprisings eventually necessitated its abandonment. In 1907 the French bombarded the town in punishment for the murder of French and Spanish workmen engaged on the harbor works, and it has been occupied by the former since that time.



Photograph courtesy Lignes Aériennes Latécoère

THE SULTAN'S PALACE AT CASABLANCA

the confluence of the Waag with the Danube. Here the river turns somewhat northward to cut a tortuous course through some farflung foothills of the great Carpathian chain; so we left it, flying, as a bird flies, straight toward our goal.

THREE AIR SERVICES BETWEEN VIENNA AND BUDAPEST

The Hungarian seated behind me clutched my elbow to note something far below us at which he was excitedly pointing; it was another plane, a German seaplane flying low along the Danube, bound back along the course which we had just covered.

Between these two capitals of the former Dual Monarchy, Vienna and Budapest, there are three competing air services—French, German, and Hungarian. Each is subsidized by its country in an endeavor to develop a national aëronautical industry. Of the three, an unbiased estimate must yield to the Germans the best results with the greatest economy.

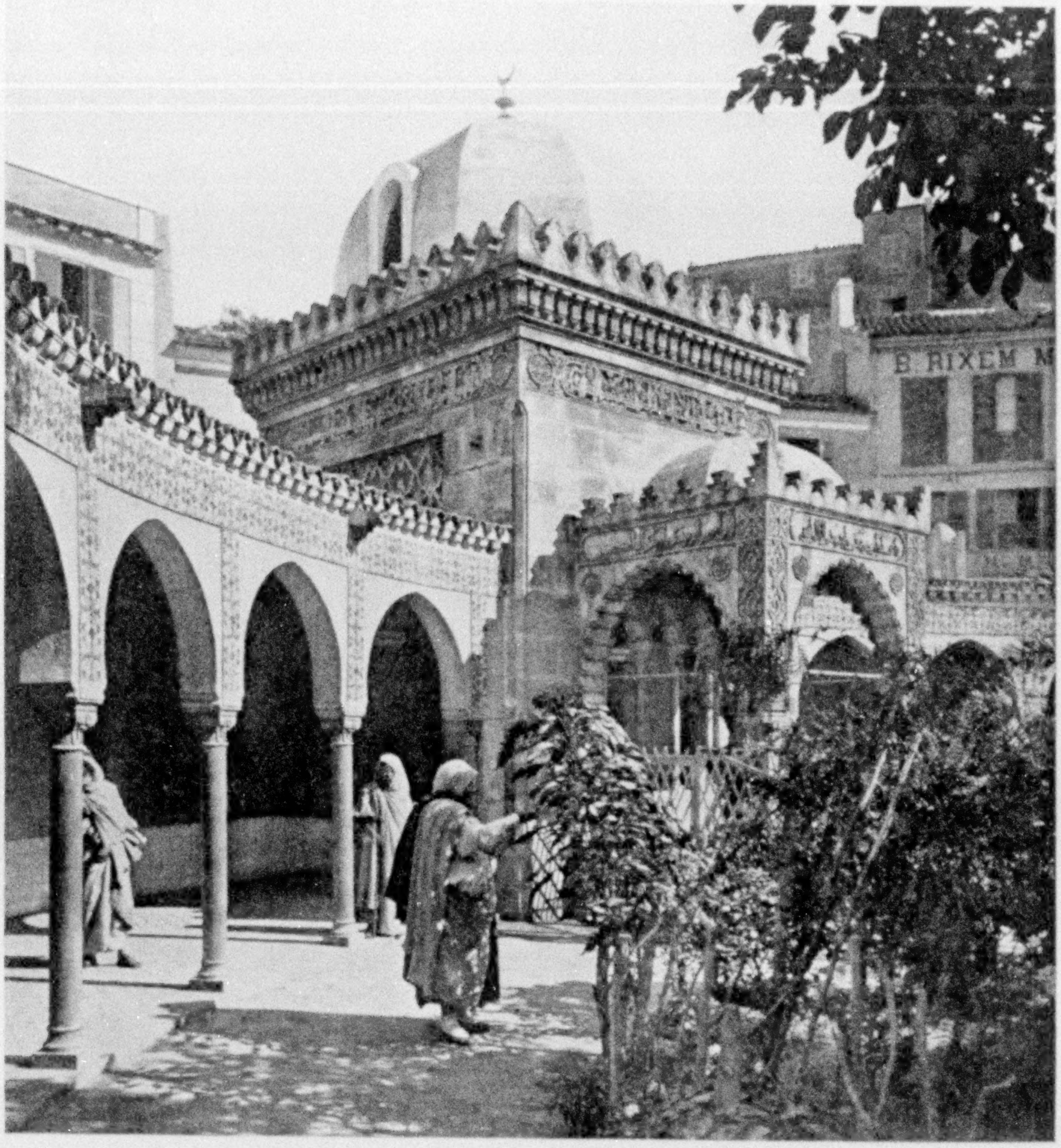
It was past the lunch hour when we landed at Budapest. Our Hungarian, now on his home ground, lost no time in bidding us adieu and disappearing in the direction of the city; but Monsieur and I had but a scant quarter of an hour to fortify ourselves before taking off in a fresh plane for Belgrade.

A mechanic pointed out the lunchroom, a small stucco building at the far end of a long row of shops and hangars, and to it we hastily made our way. A huge barefooted woman in a soiled calico slip was fussing about a stove, but our demands for food or drink of any kind or quality elicited only a curt, unintelligible response.

Having exhausted our best English, French, and German without avail, we were about to despair when an attractive girl appeared, evidently the daughter of our formidable and unkind opponent. She entered the lists in our behalf, and through her efforts we were supplied with a cup of black coffee and some buns.

Then came the question of paying: *dreissig tausend kronen*, 30,000 Hungarian crowns—a tremendous figure in prewar days, but modest enough, now that a dollar is equivalent to some 77,000.

But I had no Hungarian money, and neither had Monsieur. With praise-



Photograph from Levasseur

BEFORE THE GRAND MOSQUE OF ORAN

This religious edifice was erected by the Moslems to commemorate the expulsion of the Spaniards, in 1792. It was built with money paid as ransom for Christian slaves. Oran lies 220 miles east of Gibraltar and is the second city of importance in Algeria. An air line connects it with Casablanca, France's Moroccan seaport on the Atlantic, and continues on to Alicante, across the Mediterranean, and thence to Toulouse (see map, page 275).

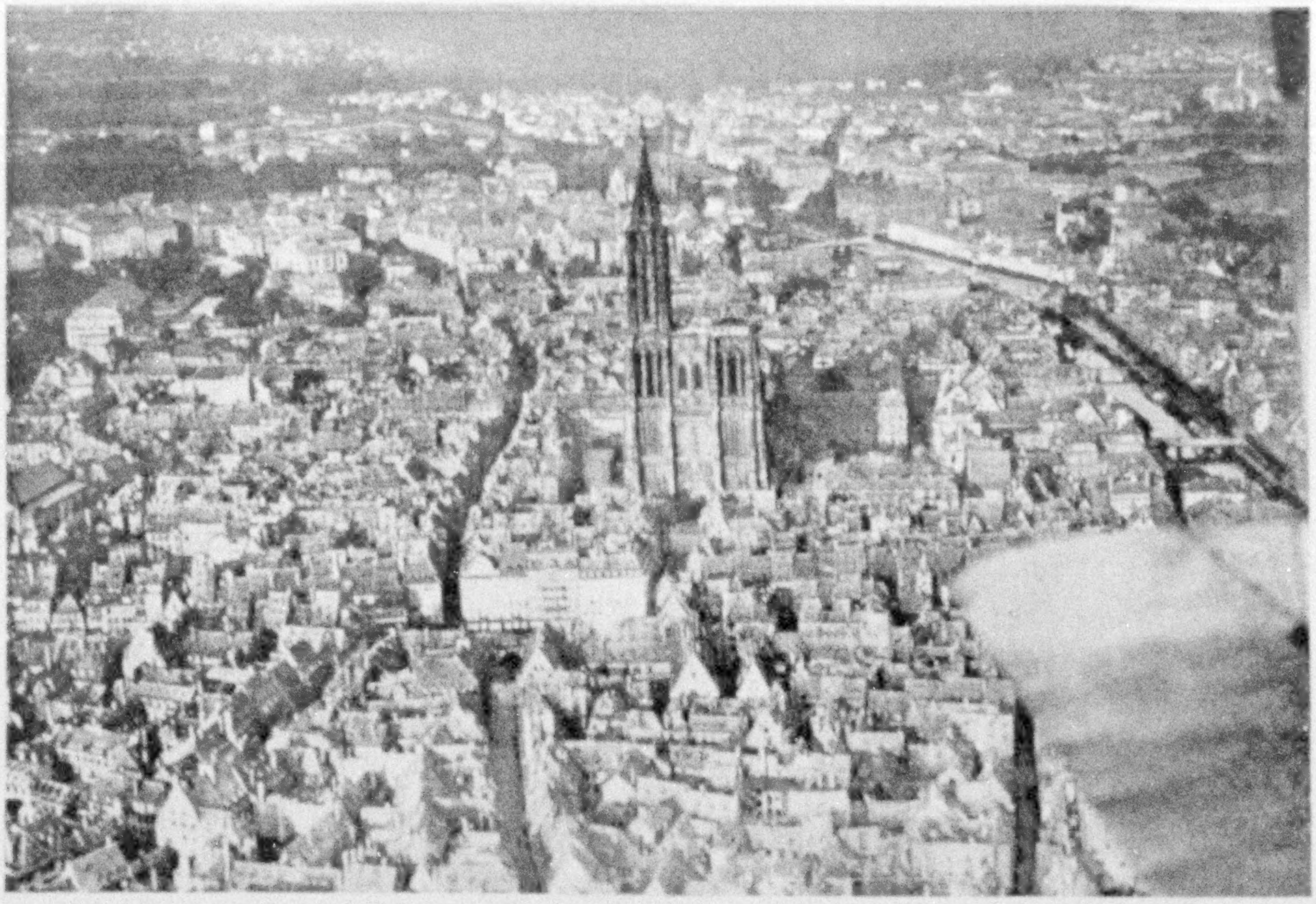
worthy foresight, Monsieur, before leaving Prague, had exchanged some francs for Rumanian lei against arrival in Bucharest, and I was prepared to settle our debts in the coin of at least five different countries. None, unfortunately, was current in Budapest.

"Let me see," I said to the fräulein in my best schoolbook German. "If 18½ French francs are worth an American dollar, and are therefore equal to 77,000 Hungarian kronen, and if 19 Czechoslovakian kronen are equivalent to 100 francs, I must owe you . . ."

At that moment the mechanic opportunely appeared to warn us that the plane was about to leave; I threw down the assorted paper bills in my hand and fled!

A WELTER OF EXCHANGE AND CONFUSION OF LANGUAGES IN CENTRAL EUROPE

It is a mystery how business can be



Photograph courtesy Lignes Aériennes Latécoère

THE CATHEDRAL AT STRASBOURG PRESENTS AN IMPOSING VIEW FROM THE AIR

Among the articles of commerce which are sufficiently valuable to be transported by airplane express is pâté de foie gras, for which Strasbourg is famous. This delicacy is shipped to Prague, Vienna, Budapest, and Bucharest by aircraft.

rationally conducted in this hodgepodge of states jostling each other between the Black Sea and western Europe. Currencies that before the World War were counted in digits now have meaning only in multiples of thousands. Relative values painstakingly learned to-day may become obsolete overnight. To this welter of exchange must also be added the confusion of a score of languages, a constant source of irritation and friction.*

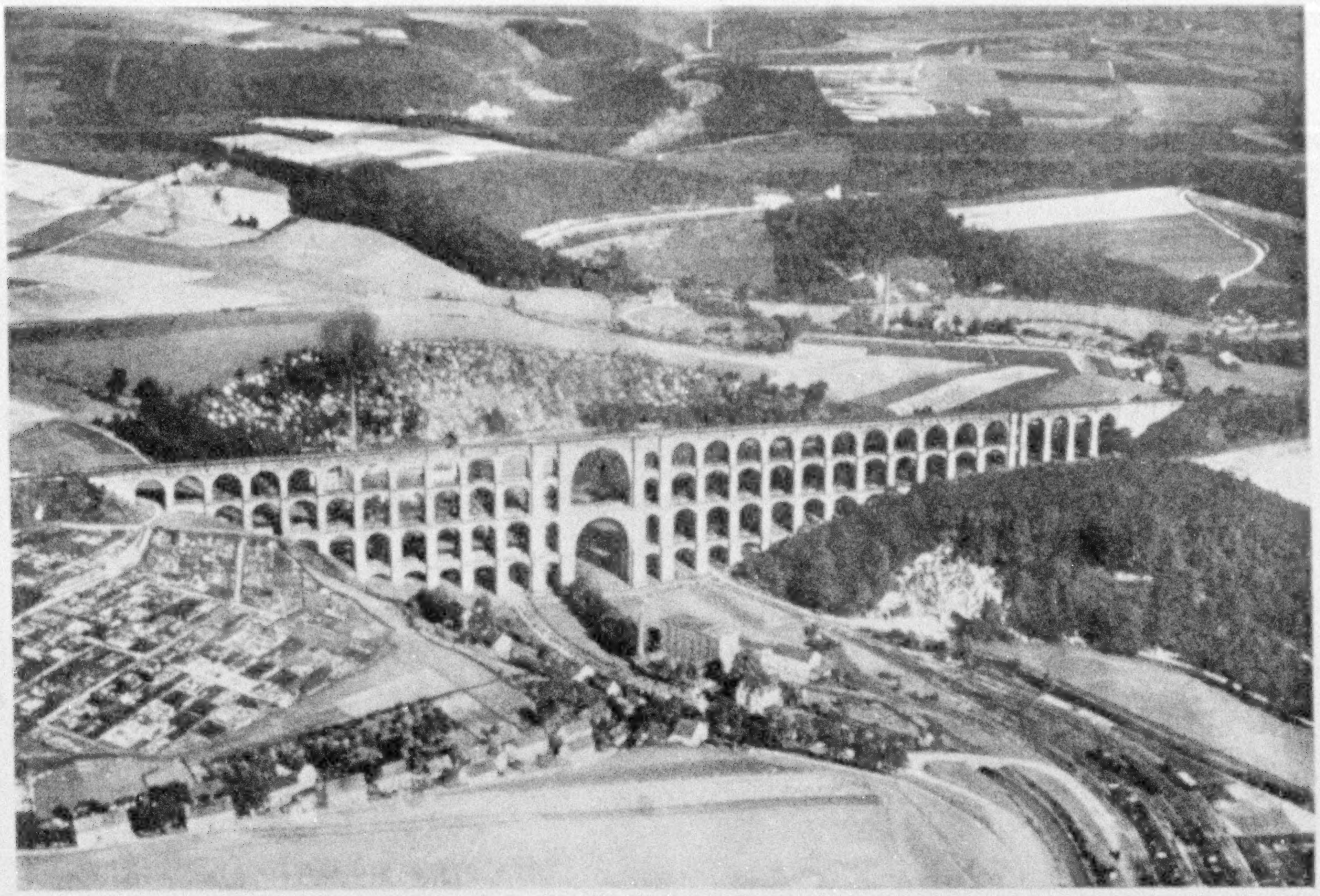
Small wonder, I mused, as our plane sped southward and the glitter of Budapest was dimmed by the haze on the horizon behind us, that this corridor between the Carpathians and the Alps should be the source of so much smoldering hatred and dispute.

There is, too, an even deeper antagonism here, for this is the meeting place of East and West, of indolence and secret privilege, with enterprise and aggressiveness. As the Moravian Hills are the watershed dividing the streams that flow westward from those leading to the Black Sea, so somewhere across this broad Danube corridor lies an invisible, intangible demarcation between the dominance of Eastern and Western ideals.

A TURBULENT PASSAGE THROUGH A STORM

A sudden severe jolting of the plane, followed by a painfully familiar sinking sensation, forced my attention to the fact that we were rapidly approaching a big rain squall. For some time the pilot had been gradually reducing his altitude and, as we passed beneath the cloud rim, the level floor of the Hungarian plain lay but a few hundred feet below us, softened in the deep shadow of the storm. Fortunately, the squall was traveling our way and raced us along at 120 miles an hour. But the turbulent air was full of "pockets" and "bumps," and caused me to wonder after a time if my hasty investment at the Budapest lunch counter had been perhaps ill-advised.

* See, also, "The Battle-Line of Languages in Western Europe," by A. L. Guerard, in The Geographic for February, 1923.



Photograph by Deutscher Aero Lloyd

REMARKABLE VIEW OF THE RAILWAY VIADUCT NEAR CRIMMITSCHAU, FORTY MILES SOUTH OF LEIPZIG

When for any reason the engine of an airplane ceases to run, the plane does not fall out of control immediately, as is sometimes thought, but continues to fly, the source of power now being gravity, and the path of flight no longer horizontal, but inclined downward by a small angle. Modern transport planes travel forward 10 to 12 feet for every foot descent of altitude; so that if the plane is 2,500 feet in the air at the time of motor failure, it may glide from five to six miles in any direction from the point where the engine failure occurred. It is very rare not to find in a circle of area of this size any field in which the plane may be landed without accident to its occupants. Since the area of the circle increases as the square of its radius, and the radius of the circle available in which to make a forced landing is proportional to 10 or 12 times the altitude at which the plane is flying, it may readily be seen how great is the factor of safety when an airplane is flown at an altitude above a thousand feet or more.

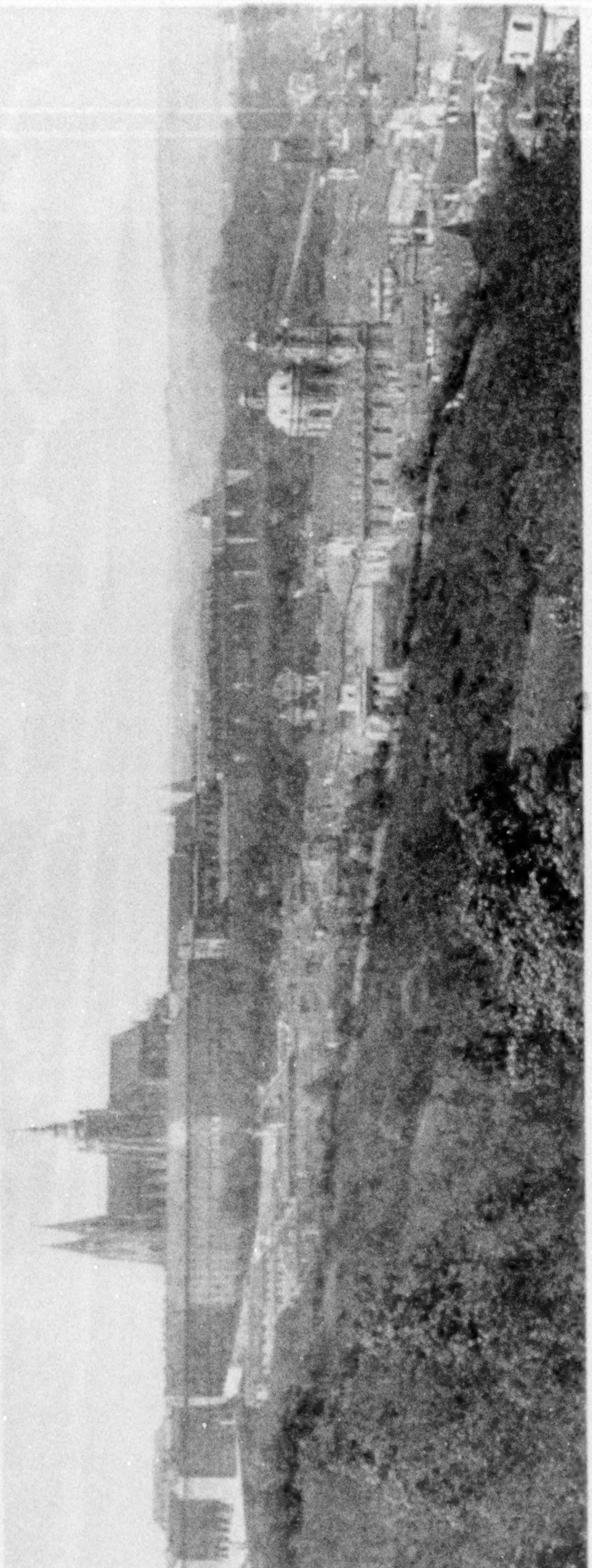
At Kiskunfelegyhaza we overtook the storm center, an awe-inspiring spectacle of Nature's pent-up fury unleashed on a hapless town. The rain lashed the gray roofs below us and ran in torrents through the narrow streets. The black spiral core of the storm threw out wraith-like octopus arms that reached down to the wet, gleaming earth, and clutched at us in sinister fashion as we slipped by to the south. But in 20 minutes we were out of shadowland into sunlight once more, the tumbled thunderheads behind us now gloriously white, towering 15,000 feet into the sky.

Occasional flashes of silver far away to our right betrayed the sluggish Danube making lazily for the sea, and the placid, level fields beneath our wing reflected the eternal youth and purity of Nature after a thousand partial corruptions.

I let my eyes close on this tranquil scene, in involuntary relaxation from the tension of our turbulent passage through the storm. The muffled roar of the engine beat less and less loudly on the drowsy senses, and when I awoke Pancsova aërodrome was rushing up to meet our wheels, with Belgrade at the wing tip across the shallow Danube.

PROCEEDING AT A "SNAIL'S PACE" OF 75 MILES AN HOUR

Five hundred and fifty air miles now lay behind us, while still some 280 miles to the east, beyond the frowning Transylvanian Alps, was our goal, the capital of Rumania.



Photograph by Rudo Bruner-Dvořák

THE FROWNING BULWARK OF THE HRADČANY, OR OLD ROYAL CASTLE, OF PRAGUE (SEE TEXT, PAGE 294)

There was no time to lose, as the afternoon was waning. Hence it was with disappointment that I noted our baggage being loaded into a large three-engined plane, whose obsolete lines gave evidence of an ancient, however honorable, vintage. This plane I darkly suspected could not cruise at much more than 75 miles an hour, at which rate we would be most of four hours and well after dark before reaching Bucharest.

The local field manager informed me that night-flying aids had been installed on the Rumanian section of the route, and that this was the "experimental" plane with which the test flights were to be made.

The announcement, however, failed to elicit any enthusiasm on my part. After traveling all day at nearly 100 miles an hour, the idea of poking along through the deepening twilight in this ancient crate at the absurd speed of 75 miles an hour was very annoying. It is curious how one grows speed-saturated in flying. Then, too, the sight of barefooted workmen tinkering about the high-strung aëronautical engines did not serve to quiet my uneasiness.

For one shamefaced moment I considered renouncing further flight that afternoon. After all, three countries should be enough for one day.

Then the thought of bargaining in some outlandish Serbian tongue for Yugoslavian currency stiffened me for the original venture. Besides, Monsieur, my French companion, had already nonchalantly taken his place in the passenger compartment of the big plane. I resolutely mounted the steps and took a chair by his side. There were accommodations for six passengers, but Monsieur and I were alone.

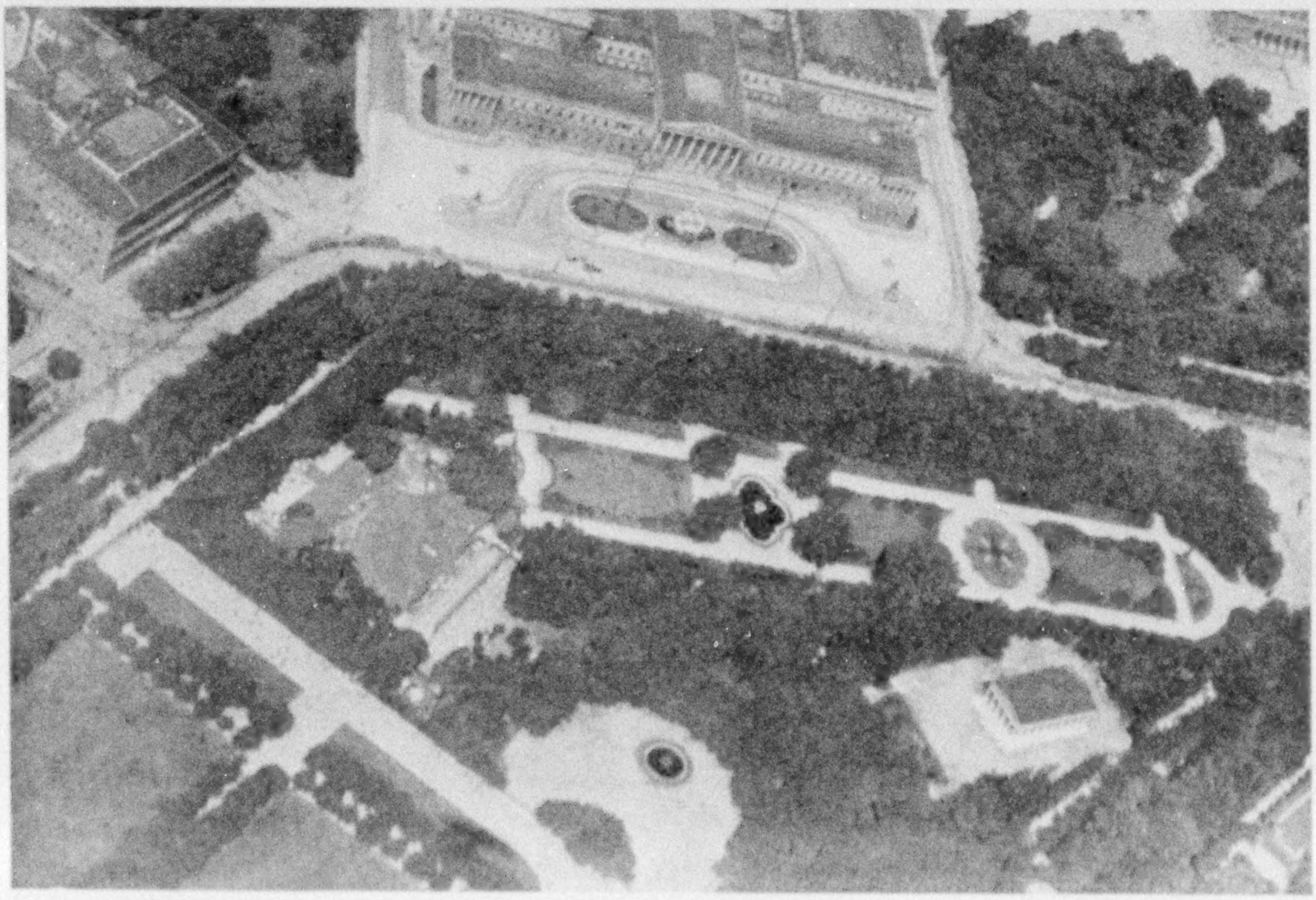
At the forward end of the cabin was a narrow door leading to the cockpit of the pilot and mechanic. A young French lad

Photograph from International

VIENNA, ON THE "BLUE DANUBE"

"One hundred and eighty-five miles from Prague, across some of the most fertile farm land in central Europe, lay Vienna. In less than two hours we were there." (For a description of the Austrian metropolis since the World War, see "Vienna—A Capital without a Nation," by Solita Solano, in THE GEOGRAPHIC for January, 1923.)

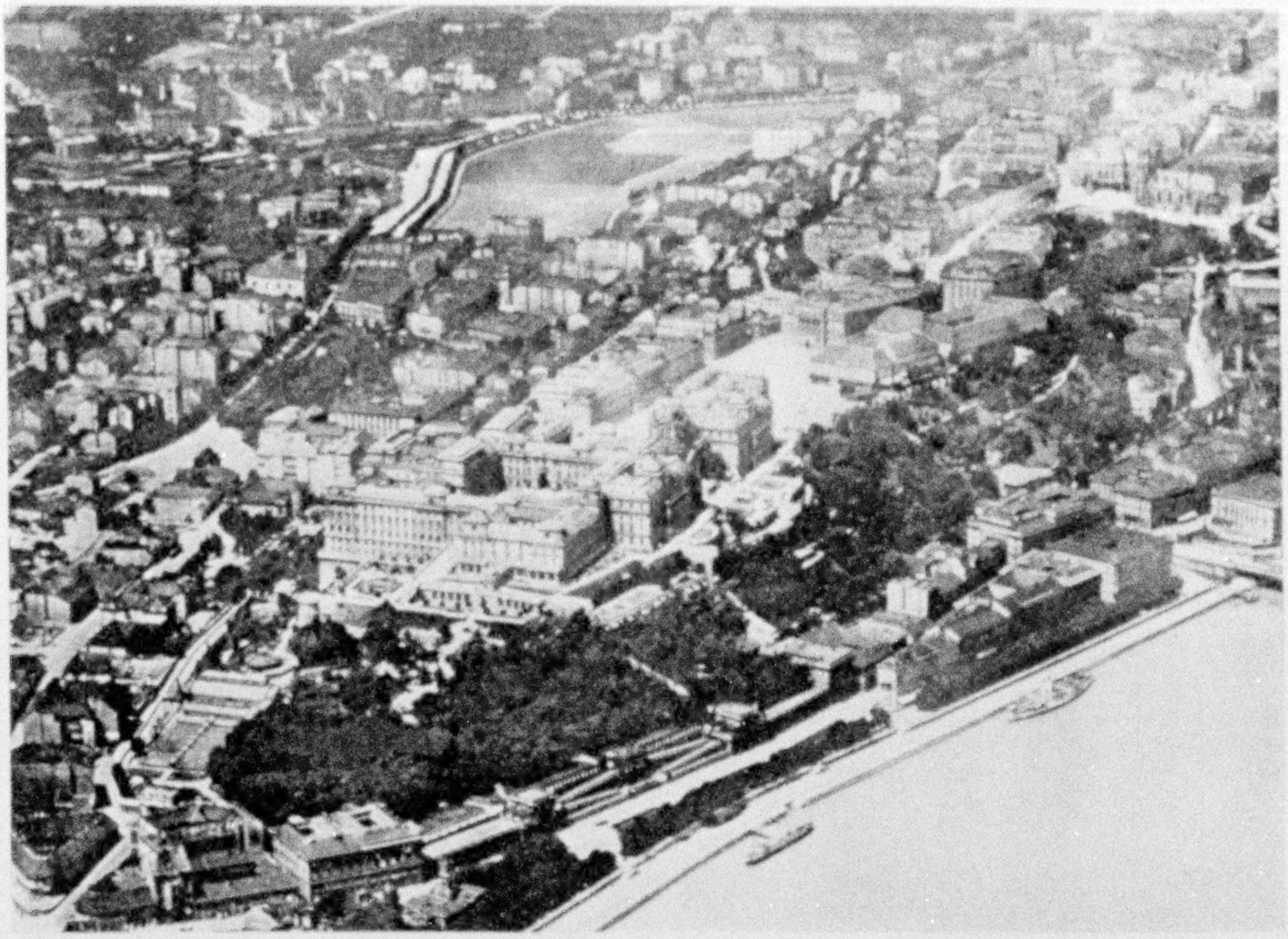
VIENNA'S LOVELY STADTPARK, WITH ITS KURSALON (FOR CONCERTS)



Photographs from Keystone View Co., Inc.

THE AUSTRIAN PARLIAMENT BUILDING: VIENNA

This is one of the most beautiful modern examples of the classic style of architecture in Europe.



Photograph from International

AN AËRIAL VIEW OF HUNGARY'S CAPITAL

Budapest rivals Vienna for civic beauty and orderly arrangement of boulevard and street. Public squares, parks, and artistically planned drives abound. The Danube is seen in the right foreground. The magnificent building in the center of the picture is the Royal Palace, built by Maria Theresa in 1749-71 and restored after a fire in 1849. Many of its 860 rooms are now used for government offices.

in greasy jumpers and leather helmet wormed his way in backwards through this doorway to hand us our passports, which had been duly stamped by the local customs agent, and to ask if the messieurs would be so kind as to take the forward seats, as otherwise the plane would be too tail-heavy.

A COPPER TUBE CRACKS IN MID-AIR

My new position brought me directly beside the engine on the port wing, a Hispano-Suiza from which the cowling had been completely stripped, exposing an alarming number of slender connecting pipes and complicated-appearing accessories. Was it a trick of the isinglass through which I was peering that made that long copper tubing along the base of the crankcase appear to vibrate so badly? Some barefoot workman must have failed to secure it properly.

With a deep-throated triune roar, the big plane plunged across the sandy field and staggered into the air. For the first time in 4,000 miles over the air lines of Europe I was distinctly uncomfortable. That copper tube vibrating in the 75-mile wind held my uneasy attention fixed.

Then I saw it crack. From the broken end there streamed out, under pressure, a liquid which I prayed was only water, but darkly suspected was gasoline. I scrambled up to open the door before me and nudged the mechanic, whose broad back obscured the passage. He took one look and crawled forward hastily to notify the pilot.

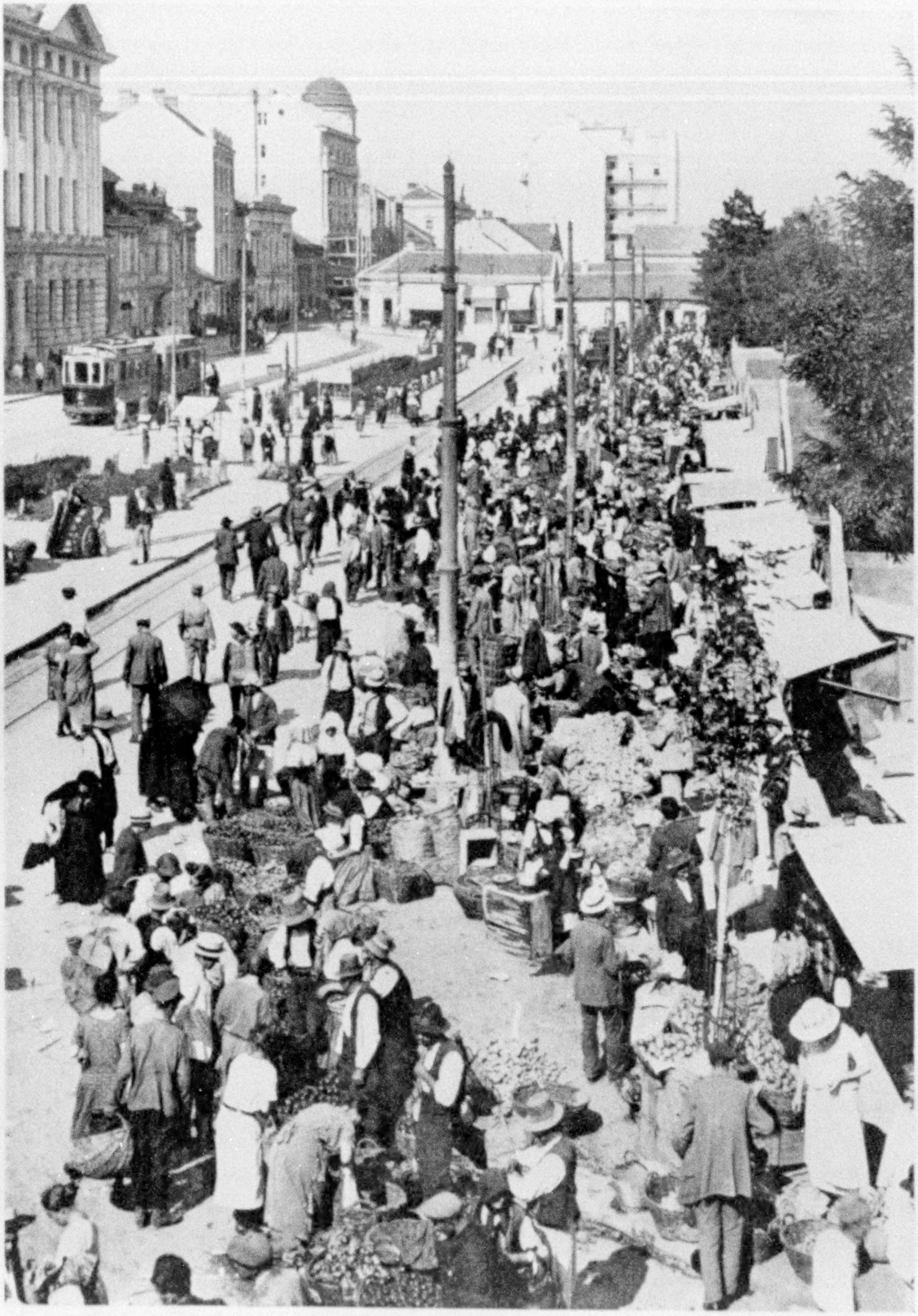
In another minute, with engines throttled, we were circling back from the Transylvanian foothills to the Pancsova field, fortunately not yet many miles to the rear.

Half an hour later we were off again, in the same plane, the offending tube having been replaced by a new one that had

Photograph by Erdelyi

THE KITCHEN OF A FAMILY OF THE MIDDLE CLASS IN THE NEIGHBORHOOD OF BUDAPEST

The author, on page 302, tells how such a young Magyar came to his aid and enabled him to buy black coffee and buns near the flying field at Budapest. Owing to the confusion of languages and rates of exchange, the difficult problem of payment was one which had to be solved arbitrarily.



Photograph by Ewing Galloway

THE OUTDOOR PUBLIC MARKET IN BELGRADE, CAPITAL OF YUGOSLAVIA

The Panscova aërodrome, the only scheduled landing field between Budapest and Bucharest, is across the Danube from Belgrade. Formerly the capital of Serbia, Belgrade, after the World War, became the seat of government of the Kingdom of the Serbs, Croats, and Slovenes, with three times the area of old Serbia and with a population of 12,000,000.

XUM

OVERLOOKING BUCHAREST, THE "PARIS OF THE EAST"

"That evening, through my window, there floated up the staccato music of hoof beats to the accompaniment of endlessly tinkling silver bells, as the youth of Rumania rode out behind dark-robed Russian cabbies" (see text below).

been secured under the supervision of the chief mechanic. This was the only instance in all my European air travels when a flight was interrupted or delayed by mechanical trouble.

It is curious that it should have occurred in an aircraft equipped with several motors expressly for the purpose of avoiding unpremeditated landings. It would seem that often the presence of additional engines, rather than acting as a further safeguard, actually may multiply the possibilities of interruption, and that the wisest insurance is to employ only the best equipment, maintained at the highest standard of skilled workmanship.

A broad white cloud lay brooding upon the outposts of the Transylvanian Alps, as we swept east 1,000 feet above, and the Danube swung in a wide arc to the south, searching an outlet through this last barrier to the sea. The brown Serbian plain was lost behind us in the glare of the late afternoon sun, while pine-clad, tumbled ranges below us reached up through broken clouds.

A strong wind at our upper altitude urged us forward, but it was already dusk when we crossed the deep-cut gorge at the Iron Gate and bade good-bye to the Danube at Turnu Severin, where it debouches upon the Wallachian plain. An hour sped by and waves of darkness crept down from the mountains massed along our left to flood the fertile fields and drown the last steely glint of the evening sun on the little streams hurrying toward the Danube, now marking the Bulgarian frontier far to the south.

Friendly lights rubbed at the tiny windows in dark wooded patches on the plain, a beacon flare winked eagerly from an emergency field below, inviting us to explore its welcome; then a dull glow against the sky, a checkerboard of myriad flashing signals, and Bucharest lay beneath our wing, a great searchlight spreading its yellow glare upon the Băneasa aërodrome.

That evening, through my window on the Calea Victoriei, there floated up the staccato music of hoof beats to the accompaniment of endlessly tinkling silver bells, as the youth of Rumania rode out

THE POTTERY MARKET IN PITESTI, NORTHWEST OF BUCHAREST

behind the dark-robed Russian cabbies to mark the quiet stars.

Royalty had withdrawn weeks before to the cool seclusion of the near-by foothills; but the street life of the city still throbbed on. Barefoot peasants along the narrow lanes jostled soldiers in slovenly uniform; a gypsy girl in brilliant scarf and rainbow-colored skirt chatted gaily with a group of bearded, dark-skinned men; above the steady rumble of the street rang out the sharp crack of a Russian whip and the warning cry of a muzhik.

DANZIG CAUSES MANY COMPLICATIONS AND HEARTBURNINGS

The unfamiliar sounds lent color to my fancy, and at length, as I fell asleep, there seemed to be spread out before me the whole great length of the Danubian watercourse, with the massive Carpathian chain and the Transylvanian Alps sprawling across it, like a sinister question mark, a symbol of the uncertain destiny of this strange, unstable land.

Seven hundred and fifty miles northwest of Bucharest, as the crow flies, lies Königsberg, the capital of East Prussia, near the shores of the Baltic Sea. An easy day's flight if one cares to make it so, but I chose the more leisurely way, revisiting the capitals that had been little more than glimpsed on the outbound journey, and thence by air via Warsaw to the quaint old city of Danzig, near the mouth of the broad Vistula.

The creation of the Free City of Danzig must have seemed like an ingenious solution to a vexing problem for the weary conferees at Versailles in the spring of 1919. But conceive, if you will, of the City of Galveston cut off from the rest of Texas by a Mexican "corridor," its customs controlled by foreigners. Can you imagine the populace any other than wildly American in sentiment, its people restive and unhappy?

Thus, in Danzig 93 per cent of a population of some 400,000 are Germans, isolated on the one side by the Polish corridor, separated on the other from their relatives and business relations in East Prussia by restrictive customs regulations. Everywhere one meets two customs officers: the Danzig "Free" City agent who takes your money, and the Polish officer who relieves the Danzig agent of it.

Photograph by J. Bulhak

A RELIGIOUS FESTIVAL IN FRONT OF THE CATHEDRAL AT WARSAW

Trains from East Prussia to Germany go through Danzig locked, with Polish guards patrolling the vestibules. It becomes as great an offense to get off a train without permission as to board it without a ticket.

SEABATHERS PARTICIPATE IN A CUSTOMS WAR

One of the amusing aspects of this customs war developed on the shores of the Gulf of Danzig, whither the townsfolk spread during the hot summer afternoons to enjoy a dip in the Baltic or to promenade along the beach.

Zoppot, the Monte Carlo or Coney Island for Danzigers, boasts a pretentious Palace of Sans Souci, which for many years has attracted a host of summer visitors from the Polish hinterland. With a foothold on the Baltic shore, Poland determined to build its own seaside resort; and a rival to Zoppot came to life at Gdingen, just across the invisible wall of the corridor. Here the visitor was to be lured and Zoppot humbled by the simple expedient of a costly visé penalty to any Pole whose preference led him to Free City territory.

But sabotage commenced. Bathers who entered the water innocently enough at Gdingen left it at Zoppot. Guards were stationed at the corridor wall, like "off-side" referees at a football game. Finally an overzealous agent shot an Englishman who, while swimming without his

Photograph by Jan Bulhak

THE ROYAL PALACE AND STATUE OF KING SIGISMUND III: WARSAW

Warsaw is an important aviation center, one air line running to Prague, another to Danzig, a third to Lemberg, and a fourth to Krakow. The variety of articles which have been shipped by air is astonishing—everything, from live frogs for experimental purposes, to steel plates needed to complete some contract job. A bear has been shipped from Moscow to the zoo at Berlin; a registered Jersey cow traveled by air from Amsterdam to Paris; a race horse subject to seasickness crossed the Channel by air.

THE CHURCH OF ST. MARY: DANZIG

Begun in 1343 and completed in 1503, St. Mary's is one of the largest Protestant churches in existence. Its massive tower, 248 feet high, is surrounded by ten slender turrets on gables.

Photographs by Deutscher Aero Lloyd

PART OF THE MEDIEVAL FORTIFICATIONS OF DANZIG SEEN FROM THE AIR

Ramparts, bastions, and wet ditches formerly surrounded the entire city, but 30 years ago they were removed from the north and west sides, the trenches filled in, and the area thus freed was laid out on a spacious plan. Much of the great city retains its picturesque medieval character, however, with narrow, winding streets, lofty and elaborately ornamented gables, and balconied windows (see text, page 313).

Photograph from Lieutenant J. Parker Van Zandt

A PLANE ARRIVING AT KÖNIGSBERG FROM MOSCOW WITH SOVIET DIPLOMATIC MAIL

The landing of this plane marked the inauguration of the joint German and Russian passenger and freight air line between Moscow and Königsberg, Prussia. The Soviet Government owns 50 per cent of the stock of the Deruluft Air Company, which operates a daily service connecting Königsberg with Kovno, Smolensk, and Moscow.

monocle, had inadvertently crossed the line, and the English High Commissioner appointed by the League put an end to firearms.

The horrors of this guerrilla warfare were duly impressed on my mind one savage rainy night while traveling by train between Danzig and Königsberg.

Under the circumstances of this article I hesitate to confess my presence on a train, but it really wasn't my fault. Three days before I had wired from Warsaw to reserve a place on the air line, only to be informed that all seats between Danzig and Königsberg were booked for more than a week.

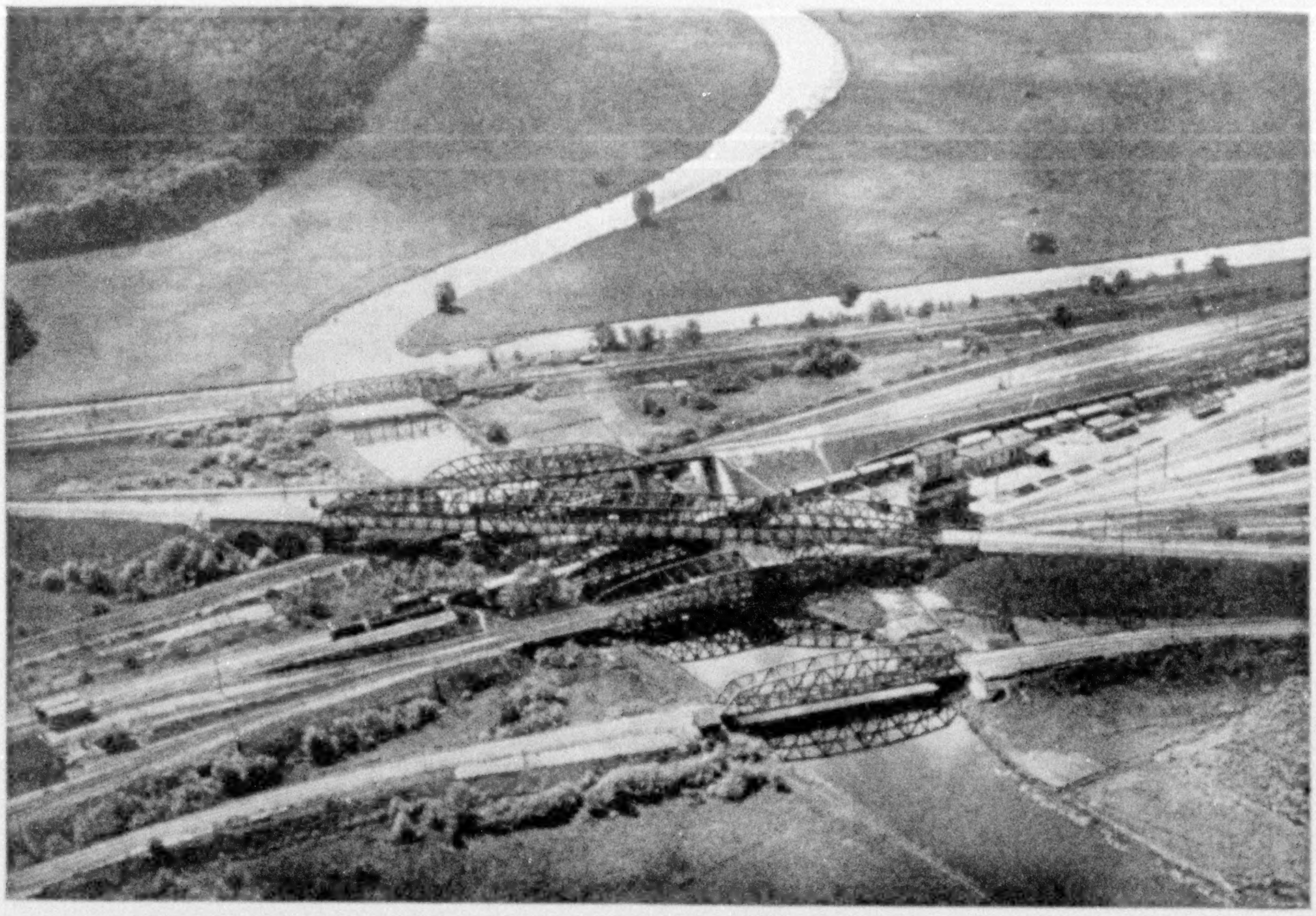
This heavy traffic had seemed a little surprising, but the explanation was not long in forthcoming. The main railway artery, which reaches Danzig from Stettin and continues into East Prussia, passes through the little city of Dirschau at the bridgehead across the Vistula, some 40 minutes out of Danzig. And Dirschau is Polish.

A glance at a map of Europe* reveals the territory of the Free City imbedded like a third molar in the Baltic jaw represented by the Gulf of Danzig, while between its roots lies Dirschau, the strategic railhead for all east-west rail traffic.

Each time a citizen of Danzig wishes to visit his cousins, let us say, in Marienburg, East Prussia, not much more than an hour's train journey away, he must pay $10 for a Polish visé for the privilege of riding five minutes through the narrow apex of land in which Dirschau lies; and in all probability he will have his baggage opened by four different customs officers—that is, unless he circumvents the whole nagging system by traveling by air.

There is an air taxi service at Danzig advertising "Zwanzig Minuten nach Marienburg" (Twenty Minutes to Marienburg), for which, needless to remark, Dirschau is not an intermediate stop; and

* See the National Geographic Society's New Map of Europe, published as a supplement with its Magazine for February, 1921.



Photograph by Deutscher Aero Lloyd

RAILWAY CROSSINGS IN GERMANY, NEAR STETTIN

The value of aërial photography in studying traffic and highway problems is suggested by this view. The French occupation of the Ruhr created an unusual condition at Cologne, where German merchants were practically shut out from all outside markets except as they could be reached by air. As a result of this embargo, very heavy freight shipments were recorded between London and Cologne, including 55 motorcycles and 100 tons of tobacco. For a time the German Government resorted to shipping German paper money into Cologne by sending it first to London by airplane and thence by air back across the Channel into Cologne. This proved highly satisfactory for their purposes until one plane, loaded with many billions of paper marks, had the misfortune to make an emergency landing in a French zone, and thereafter the shipments ceased.

there are busses which will carry one as far as Königsberg—without crossing Polish territory.

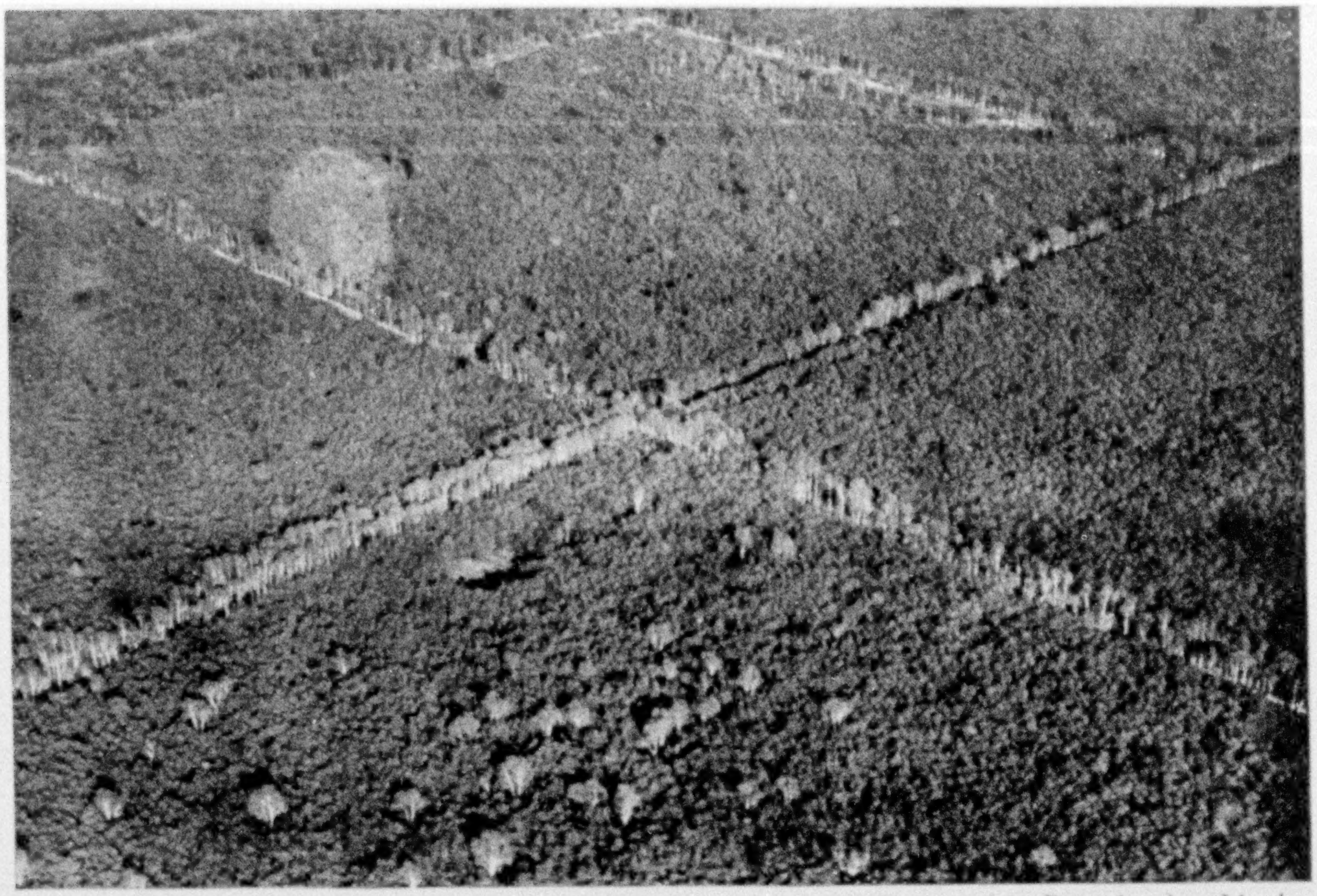
I reached Dirschau late at night on my enforced train journey, without a special Polish visé, the dismal light of the long platform revealing the steady downpour of an early autumn rain on the sodden streets beyond. For ten minutes my fate hung gloomily in the balance, while a score of customs officials cross-examined me and pondered whether or not to leave me with my baggage under the dripping eaves.

Finally a kindly Pole, with whom I had struck up a casual acquaintance, assured the unfriendly agents I was a *bona fide* American diplomat, and that grave international dissension might arise were I detained.

Thus I was permitted to continue, after being strongly warned to procure an additional Polish visé before attempting to return. Of course, I earnestly agreed to do so, with the mental proviso that I would not soon again wander so far from the friendly freedom of air travel.

THE PROSPECT OF A RACE OF AËRIAL COMMUTERS

In contrast with this harrowing tale, the journey back to Danzig by air was idyllic. It was early morning, and the rising sun threw splashes of color on the green meadow through scattering clouds that overhung the Königsberg field. The Nord Europa Union monoplane to Riga and Helsingfors was the first to get away; then the big liner for Smolensk and Moscow, carrying the Russian courier and several hundred pounds of diplomatic mail (see page 317).



Photograph by Deutscher Aero Lloyd

FOREST CONTROL BY AËRIAL PHOTOGRAPHY

The German Government and municipalities exercise a close control over the forest districts under their jurisdiction. The accompanying picture illustrates the use of aërial photography in the study of different types of growth and in recording the development of young timber.

A few minutes later we took off in a metal limousine plane, scudding before a following wind across the ivy-covered university where Kant once taught.

The streets were bedecked with flags for the anniversary of von Hindenburg's defeat of the invading Russians in the swamps of East Prussia. Most of these flags were the old imperial black, white, and red; here and there, occasionally, the symbol of the new democracy—black, red, and gold, the flag of the revolutionists of 1848—was rather furtively displayed.

Where the Pregel empties into the landlocked finger bay of the Frisches Haff, the sun withdrew for a time behind a misty wall and "the hooded clouds, like friars, told their beads in drops of rain." A beautiful rainbow loop formed beneath us, thrown out, as it were, from our whirling propeller and curving upward to our opposite wing tip, like a magic golden ring, through which we sped above the sandy strip along the Baltic shore.

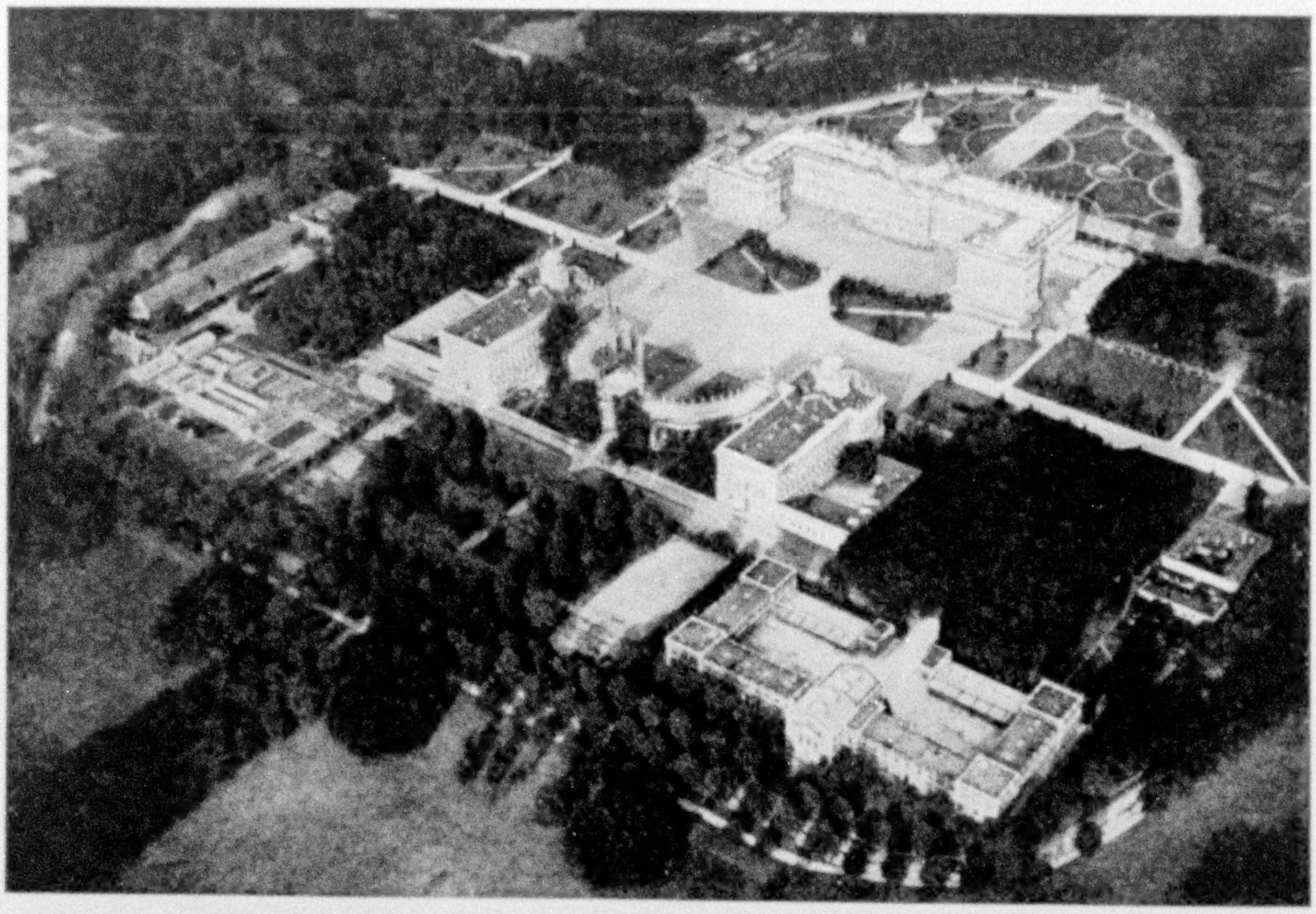
The muffled roar of the engine penetrated but little into our comfortable cabin, and my German traveling companions engaged earnestly in some business conversation, wasting few glances on the placid scenes unrolling beneath our feet.

It may be, when a race of aërial commuters has been created, that many will fly, as they say in the "Bhagavad-gītā," like a spoon through soup, without perceiving the flavor thereof. But flight is an esthetic experience, as the quickening spectacle of Nature must always be, "full of a serious sadness and a large peace."

AIRCRAFT TO PLAY IMPORTANT RÔLE IN ENRICHING LIFE

The toy fishing vessels rolling in the trough of a Baltic wave; the tiny figures of fishermen on the white sand stretching out their dark nets; sudden silver gleams from wheeling gulls; the rich green meadowland edging the blue lagoon—such scenes stir the fancy and enrich the mind.

Indeed, aircraft are destined to play an important part not only in the ordering, but in the enrichment, of life; for they

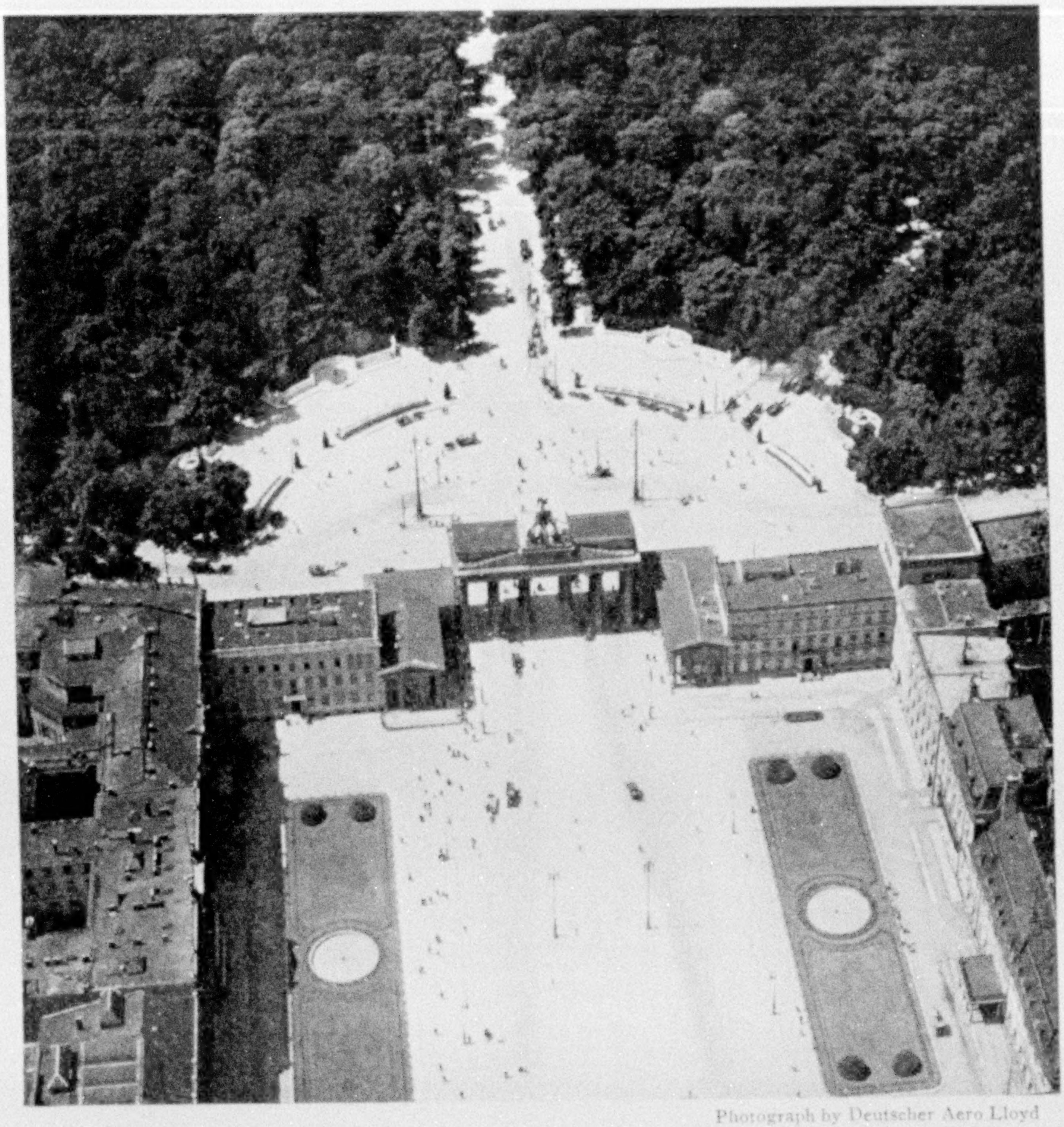


THE EX-KAISER'S FORMER PALACE AT POTSDAM PHOTOGRAPHED FROM THE AIR

Photographs from International

THE HOME OF THE REICHSTAG, IN BERLIN

To the left is the Königsplatz, photographed from the German passenger dirigible *Bodensee*.



Photograph by Deutscher Aero Lloyd

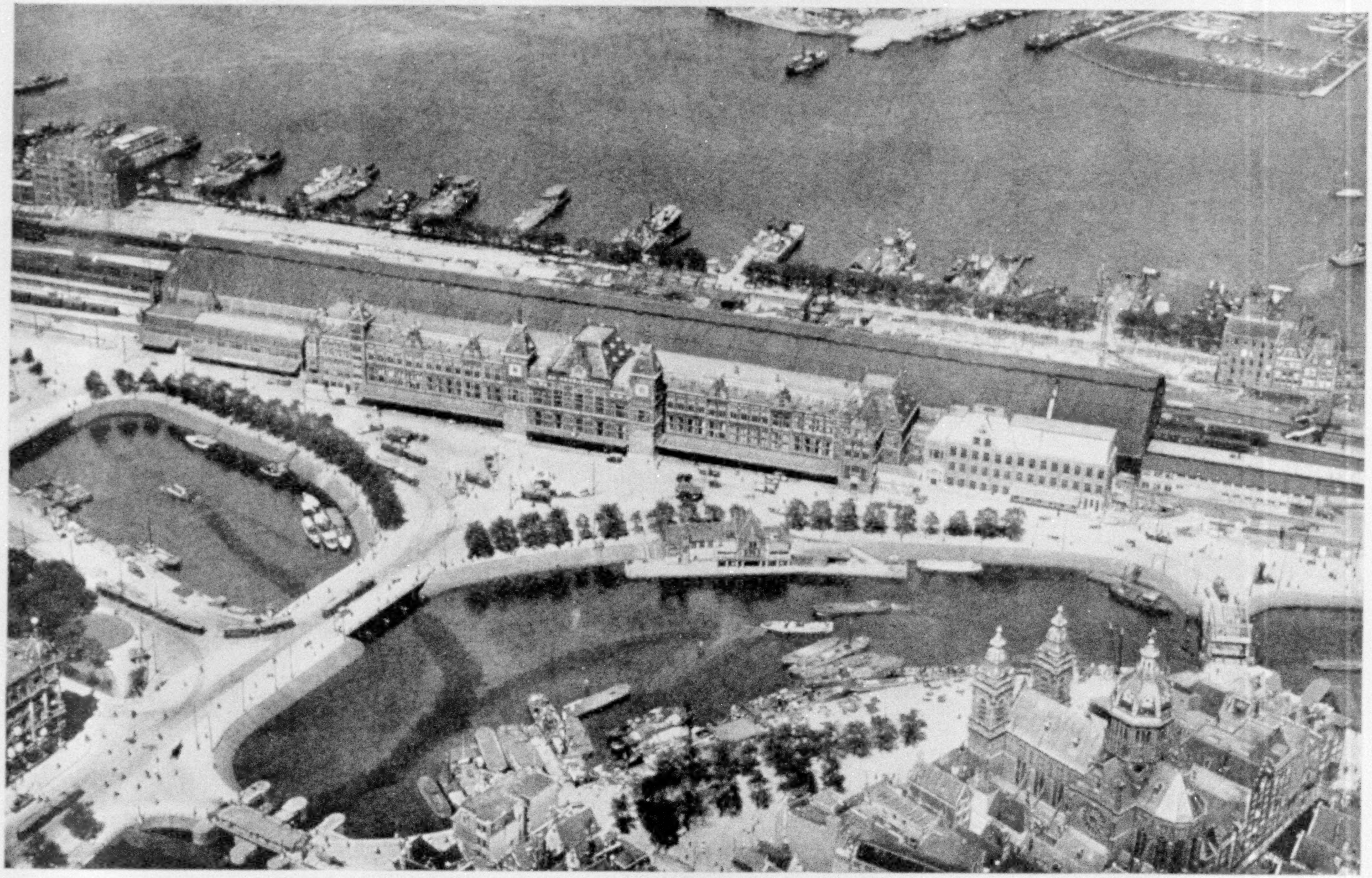
LOOKING DOWN UPON THE BRANDENBURG GATE, TOWARD THE TIERGARTEN, FROM AN AIRPLANE ABOVE UNTER DEN LINDEN: BERLIN

The city of Berlin has recognized that its present airport at Staaken, 12½ miles out, is too far from the center of the city, and it has donated Tempelhofer Feld, a military parade ground only a few minutes by taxi or street car from Unter den Linden, to be made into a municipal aerodrome. Among the European peoples, the Germans seem to take most naturally and readily to air travel, then the Dutch and English, and last of all the French. Nevertheless, of the four countries, the French Government is spending considerably more than any of the others to encourage and build up a commercial air transportation industry.

contribute to our control over our environment, which is the fundamental value of all natural science.

In an hour the red-tiled roofs and narrow streets of Danzig lay beneath us, the massive monument of the Church of St. Mary, with its "Dunkle Giebel, hohe Fenster" towering above its neighbors (see illustration, page 316). We glided down for a landing at the Langfuhr municipal field, to await the connecting plane from Warsaw before pushing on to Berlin.

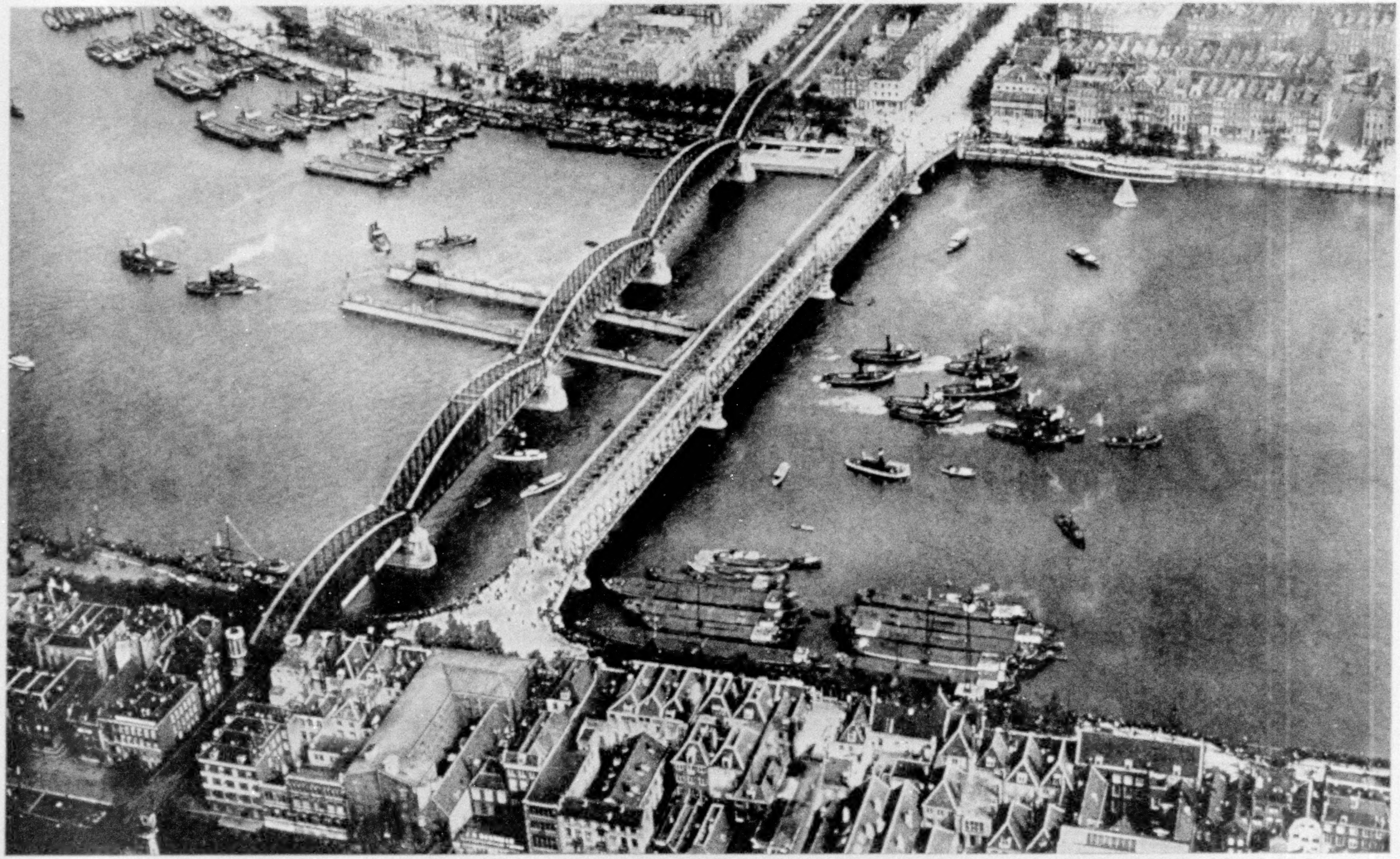
Reflection upon esthetic experience must often remain abortive or incoherent, yet there is one quality I would express



Photograph by Royal Dutch Air Service

THE CENTRAL STATION OF AMSTERDAM, WITH THE HARBOR IN THE BACKGROUND

The Zuider Zee may not always be one of the charming sights of a flight between Berlin and Amsterdam, the commercial capital of Holland. Dutch engineers are busily at work planning to shut off this inland sea and to pump much of it dry, thus adding another large section to the portion of Dutch territory now below sea level. If this project is successfully carried through, the little island of Marken may lose its unique character as a bit of the old Holland where native costumes are still worn, and its sanctuary will be violated by passing automobilists.

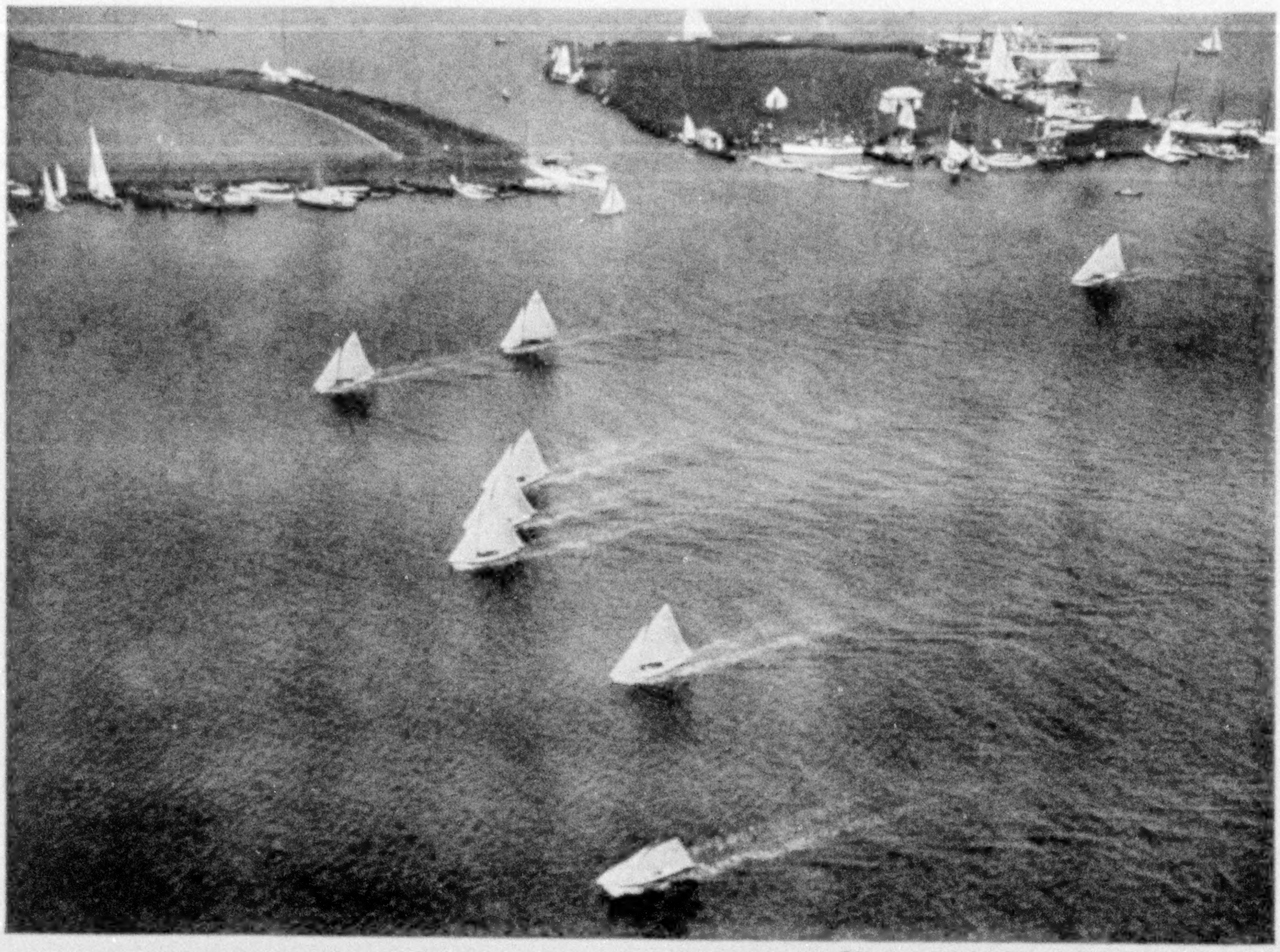


Photograph by Royal Dutch Air Service

A VIEW OF THE RIVER MAAS (MEUSE) AT ROTTERDAM

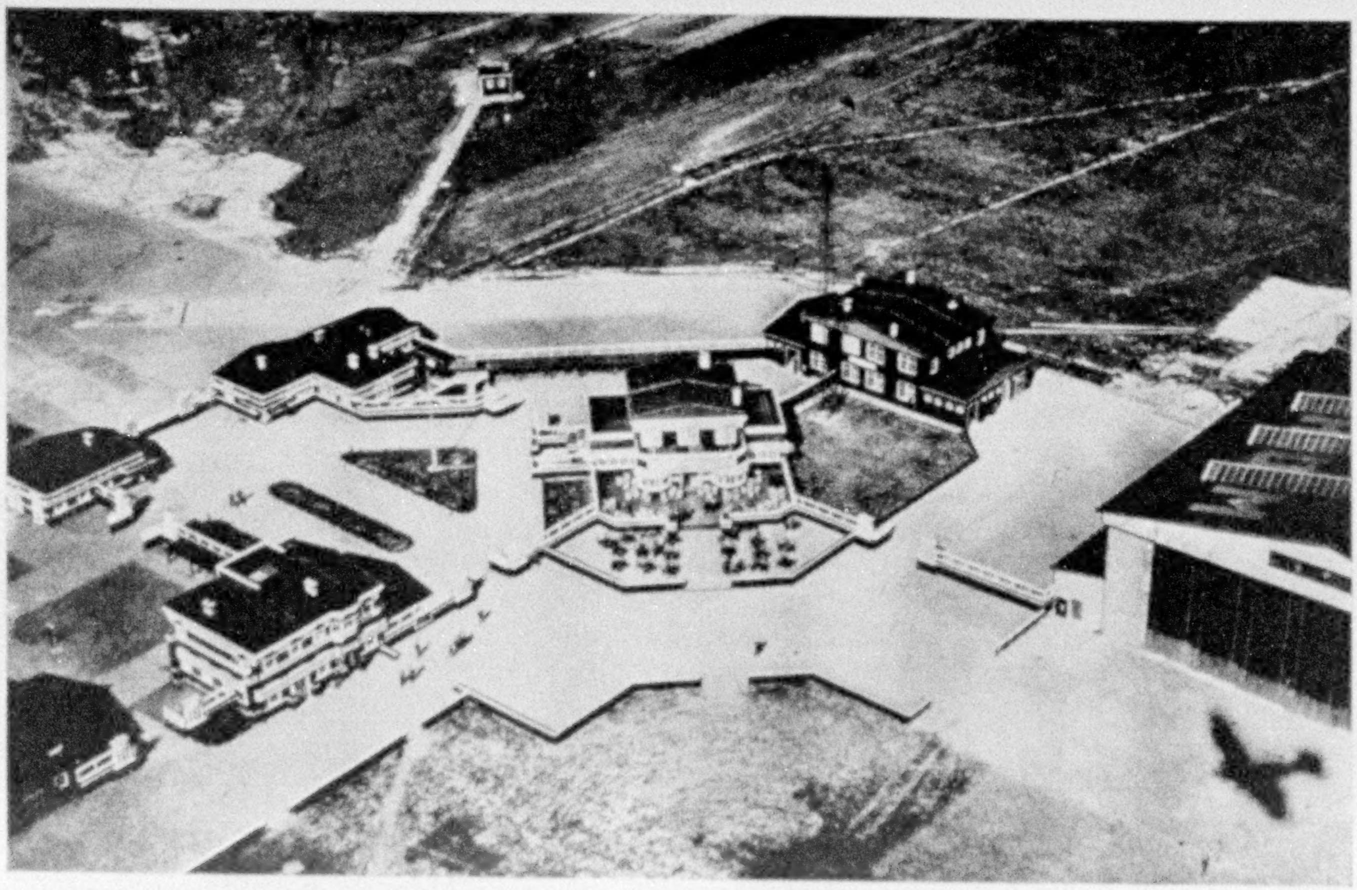
The fleet of tugboats in the right center is engaged in towing a dry-dock beneath the two bridges. With more than half a million population, Rotterdam is second only to Amsterdam in size among Dutch cities. It handles more than 60 per cent of the shipping of Holland.

XUM



Photograph by Royal Dutch Air Service

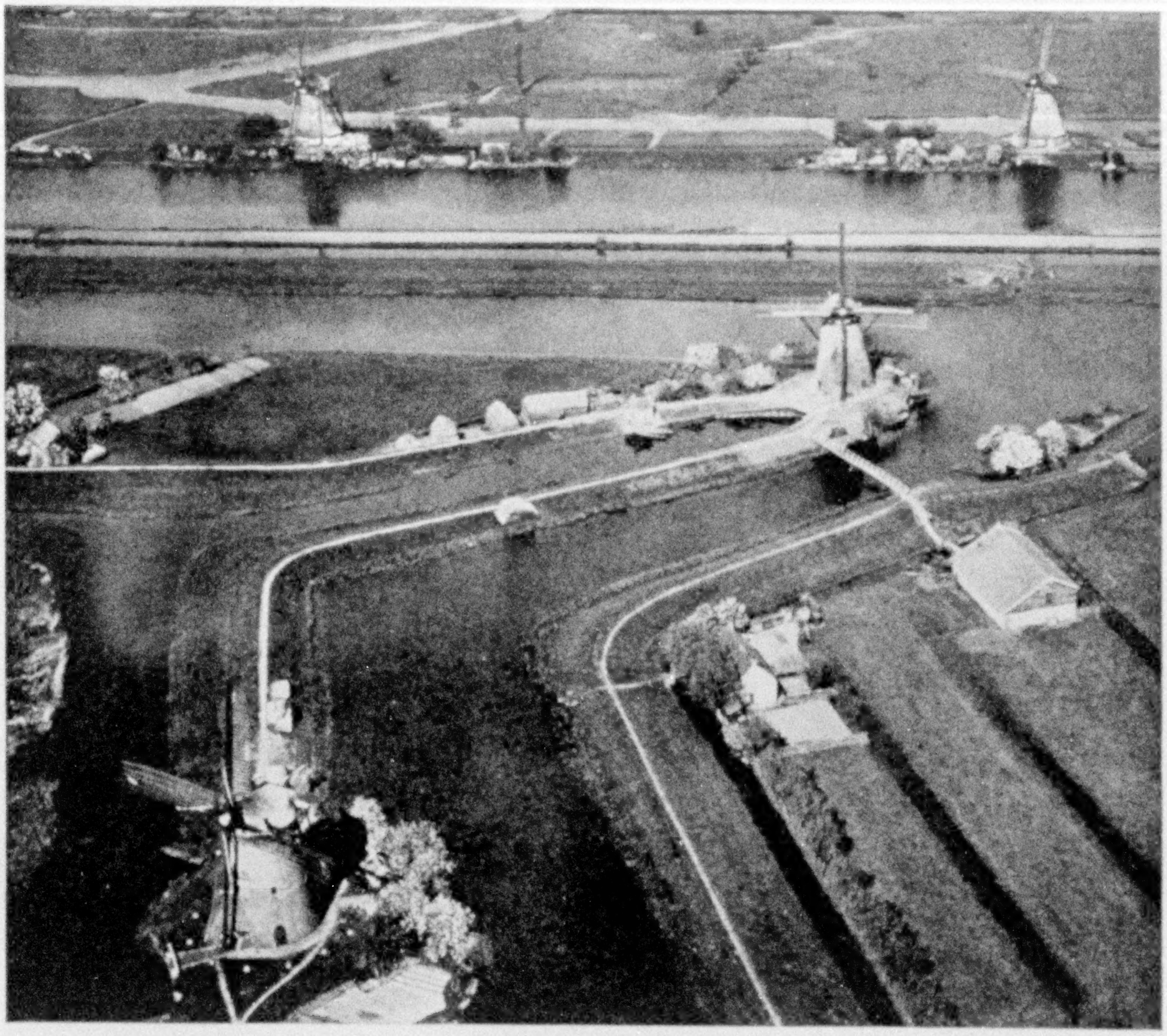
SAILING RACES NEAR ALKMAAR, NORTH OF AMSTERDAM



Official Photograph, U. S. Army Air Service

AN AËRIAL VIEW OF THE MUNICIPAL AIRPORT AT ROTTERDAM, HOLLAND

In the center may be seen the hotel and restaurant. This field was established and constructed wholly at the expense of the municipality, on reclaimed ground, in connection with its port development projects, and is one of the model aërodromes of Europe. Note the shadow of the plane in the right foreground.



Photograph by Royal Dutch Air Service

A VIEW OF POLDERS (SECTIONS OF ARTIFICIALLY DRAINED LAND) AND WINDMILLS NEAR RIDDERKERKE, IN THE NEIGHBORHOOD OF ROTTERDAM

if I could. The freedom of flight represents in a real, objective sense a partial removal of the ordinary checks and restraints that normally impose themselves between our will and our actions, between impulse and event. There is a temporary harmony with one's environment where momentary preference may be indulged without opposition.

This is, of course, only a limited freedom, but it is, nevertheless, a partial, however elemental, approach toward that adequacy and perfection which is commonly designated as omnipotence. In this fact may lie some explanation of the deeper esthetic satisfaction that lingers long in the memory after a particular flight is past.

But "to feel beauty is a better thing than to understand how we come to feel it."

It is September and I am in London again, having flown over from Amsterdam this morning, across the dikes and tulip beds of Holland, with a company of Dutchmen in a monoplane, thus completing 6,500 miles of looking down on Europe. Europe is big, but not so big that with such a vantage the mind cannot retain a vision of the whole line and contour of it—a vibrant, living picture.

A VISION OF EUROPE

One learns without conscious effort the geographical origin of so much of Europe's history; the inevitableness of misunderstanding and conflict where political lines have been flung recklessly across mountain and watercourse, now throttling an isolated valley, now barring an ancient people from their natural outlet to the sea.

There comes flooding back the vision of castellated battlements along the Dan-

Photograph from Lieutenant J. Parker Van Zandt

AN ELEVEN-SEATER COMMERCIAL AIRPLANE EQUIPPED WITH A 450-HORSEPOWER NAPIER ENGINE

This is a type of plane used in the air service between London and Berlin, Cologne, Brussels, and Amsterdam. Freedom from breakage and theft is an important factor contributing to the growth of air express traffic on European air lines. Fragile goods, vases, and other articles are dispatched by air in order to be sure of careful handling. Insurance rates covering all risks on shipments such as dresses, furs, jewelry, fragile goods, light machinery, etc., between London and the Continent are less by air than by boat or rail. Much gold and silver coin and metal is shipped by air across the Channel. One plane, for example, from London to Amsterdam carried two million dollars' worth on a single flight.

ube bank; of castles nestling in the German hills; of châteaux, half hidden in poplars, stepped up like organ reeds against the warm colors of the French countryside; of ripening grain on the Moravian slopes under a late afternoon sun; and of the bold, free sweep of the Mediterranean, stretching out in tranquil beauty to an unreal horizon.

But the real, luminous beauty of Europe seen from above cannot be phrased. It is there, now happily within the reach of every arrant lover of living, this precious gift bestowed by flight. But the deeper wonder of it is of the nature of things which talk does not easily pursue; in the end it remains something incommunicable, irrational, and final.

ACROSS FRENCH AND SPANISH MOROCCO

By Harriet Chalmers Adams

Author of "Adventurous Sons of Cádiz," "A Longitudinal Journey Through Chile," "Rio de Janeiro, in the Land of Lure," etc., etc., in the National Geographic Magazine

IT WAS a spring evening when our train from Oran, in western Algeria, rolled into the town of Ujda (Oudjda), just over the French-Moroccan border. We were entering this land of romance and mystery by the back door. The new front door is at Casablanca, chief harbor of the Protectorate on the Atlantic seaboard (see map, page 331).

It had been our intention—my sister's and mine—to sail from Oran to Gibraltar and down to Casablanca. Souli Mohamed was responsible for the change of plan.

Souli Mohamed is the smiling, white-turbaned Moor who fills the trying post of head porter at the hotel in Oran. It was he who suggested the Ujda route.

"Fez? Yes, I know it," he told me in Spanish. "It is the home of my father. From Fez to Casablanca there is now a railroad—fine, big cars, like the ones which run from Oran to Ujda; but between Ujda and Fez there runs only a very narrow train, on which none but the soldiers may ride. Why do not the Señoras travel by automobile from Ujda to Fez? The barber across the street will sell them tickets."

That settled it. We had bought stamps at the tobacco shop and gluten bread at the chemist's, but it would be a new experience to buy automobile tickets from the barber.

Monsieur-the-barber came from Bordeaux and spoke only French. Madame, his pretty, plump wife, a Jewess of Oran, spoke Spanish, the tongue of the Jews of Oran and of many of the Children of Israel native of North Africa.

This automobile service, we learned, was maintained by Madame's brother in Ujda. It was a "jitney" line, in no way connected with the big French company, the French touring cars, or the chain of French tourist hotels operated throughout North Africa. We were, in fact, the first foreign travelers to apply for passage. The line was patronized by Moors and Algerians, by Oran Jews and an occasional French commercial traveler. We should meet no tourists and many natives.

And the motor cars? *"Très, très bonne,"* Madame assured us. There was triweekly service, she said, and each passenger could carry 60 pounds of luggage. It required one long day's travel from Ujda to Fez. Should she make the reservation by telegraph? . . . It was agreed. We went back to the hotel to pack the most of our luggage for shipment by sea to Gibraltar.

ORAN IS BECOMING AN AFRICAN CHICAGO

Oran, 261 miles west by rail from Algiers, is on its way to become an African Chicago. Distinctly modern in appearance, despite its rich historical background, it is rapidly gaining commercial importance in the export of cereals, wines, olive oil, cattle, and hides. The Oran Bay, which once knew corsair galleys and for three centuries sheltered Spanish craft, is to become Algeria's chief naval base.

Back of the city lies a fertile agricultural region settled by French colonists; and still farther back, beyond the high plateau, that little-known division of French Africa called the Southern Territories. To the northern edge of this arid hinterland the Algerian State Railway has penetrated, to and beyond the palm-studded oases of Figig (Figuig) and Colomb Béchar, more than 400 miles inland from Oran, on its arduous way across the vast Sahara to the French Sudan.

It is difficult to realize, even in this age of swelling empires and shifting frontiers, that Greater-France-in-Africa is to-day 20 times larger than France-in-Europe. Second in size comes Great Britain, with a territory 30 times larger than the British Isles.

Before starting across French Morocco, let us take a panoramic view of its land and sea boundaries. Beginning on the east and swinging around the circle, we have: Algeria, French; Southern Territories (really the northwestern Sahara), French; Rio de Oro and Ifni, Spanish; the Atlantic Ocean; Spanish Morocco;

Photograph from Levasseur

AFTER A SNOWSTORM IN THE OUTSKIRTS OF TLEMÇEN, ALGERIA

With an elevation of 3,000 feet above sea level, Tlemçen is a health resort, popular among the French residents of the North African coast.

and a bit of the Mediterranean Sea, where French Morocco "comes up to the blue" between Spanish territory and French Algeria.

Were we to fly over the country, looking down on its sloping coastal plains, snow-capped mountain chains, and stretches of tawny desert, we should see that the ranges of the Atlas, higher here than in Algeria or Tunisia, traverse it from southwest to northeast, protecting the northern temperate region from the hot winds of the Sahara.

West to east through the Spanish zone, paralleling the Mediterranean, extends the maritime chain of the Atlas known as the Riff. It is through a depression between the Riff Range and the Middle Atlas that the road from Ujda to Fez runs. Ages ago, before the existence of the Strait of Gibraltar, the waters of the Atlantic flowed through this depression to mingle with the waters of the Mediterranean.

French Morocco, which the French call *Maroc*, is, roughly, the size of the State of Texas; Spanish Morocco, known to the Spaniards as the *Marruecos*, is about as large as Massachusetts. Up in the northwest corner, nearly encircled by Spanish territory, is an area more than twice the size of the District of Columbia

STRANGE PARTNERS TILLING THE FERTILE SOIL OF NORTHERN ALGERIA

South of Oran lies a productive agricultural region settled by French colonists, but farther back, beyond a high plateau, lies the little-known division of French Africa known as the Southern Territories.

given over to an international zone. Here Tangier lies.

FIELDS OF NARCISSUS, IRIS, AND MARIGOLD GROWING WILD

I should like to follow the spring longitudinally up and down the world! When the leaves are falling in Argentina and South Africa, it is blossom-time in the United States and along the Mediterranean.

Spring had come in a flash to western Algeria as we journeyed those eight hours by rail from Oran to Ujda. The terra-cotta soil contrasted pleasingly with the verdant fields. Vineyards alternated with grain fields and orchards, the fruit trees a perfect glory of white, pink, and mauve. The almond is indigenous to this country.

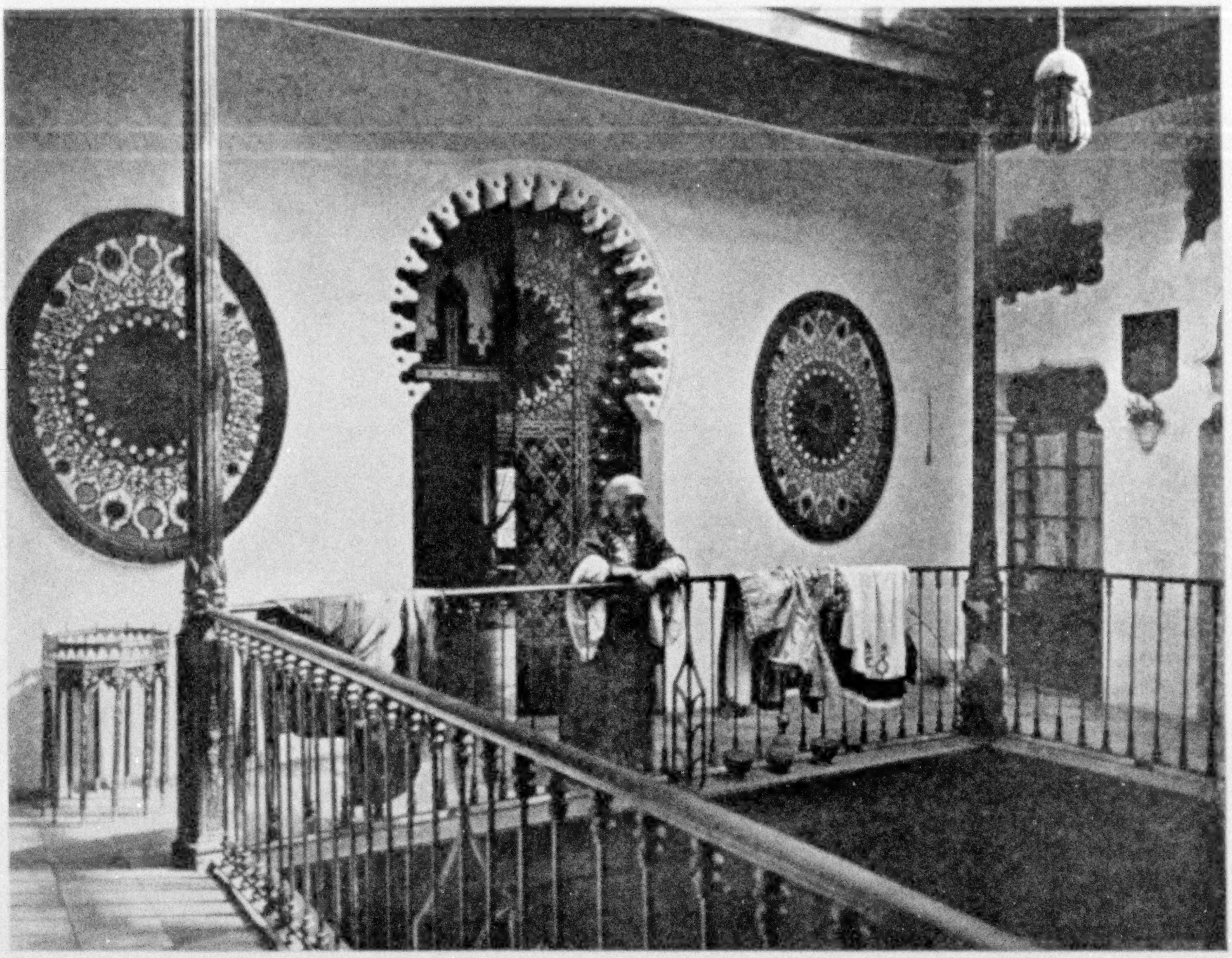
And the wild flowers! I had read that in the springtime Morocco is carpeted with wild flowers, and this magic carpet, it seems, stretches eastward into Algeria. There were bluebells and slender pink lilies, starry daisies and brilliant marigolds. Lupine grew beside the red-pink clover. There were marshes gay with purple iris and fragrant white narcissus, which we cultivate at home.

Turbaned farmers, in flowing white robes, were at work in the fields. I saw a type of haystack new to me, plastered with mud as a protection from rain. In shape it resembled the ancient Mayan buildings seen in southern Mexico and Central America—pyramidal, built up in steps. Perhaps it is Berber in origin and has survived the series of invaders—Phœnician, Carthaginian, Roman, Vandal, Arab—who drove the earliest agriculturists to the hills.

Near the native villages, with their blank white outer walls and their inner courtyard walls of vivid blue, lay the creamy red-tile-roofed villas of the French colonists. Paralleling the railroad track ran a gleaming white metaled highway, as well built as any road in France.

ALGERIA HAS BECOME ALMOST A PART OF FRANCE ITSELF

In the dining car, at luncheon, I saw two young Algerians wearing European



Photograph by York and Son

THE UPPER STORY OF A MOROCCAN HOUSE

clothes and red fezzes, drinking native Royal Kébir wine. Across from them sat a stately old Arab, in snowy robes and high turban, sipping black coffee, too good a Moslem to drink wine or spirits in any form.

Up, up we climbed toward the plateau, with charming vistas back on this new agricultural France-in-Africa, so closely linked with the motherland by fast steamer from Marseille. After nearly a century of French rule, Algeria is virtually a part of France itself, sending representatives to the government in Paris. Here military officials are subordinate to civilians. Morocco, so recently brought under French control, has, as we shall see, a very different status.

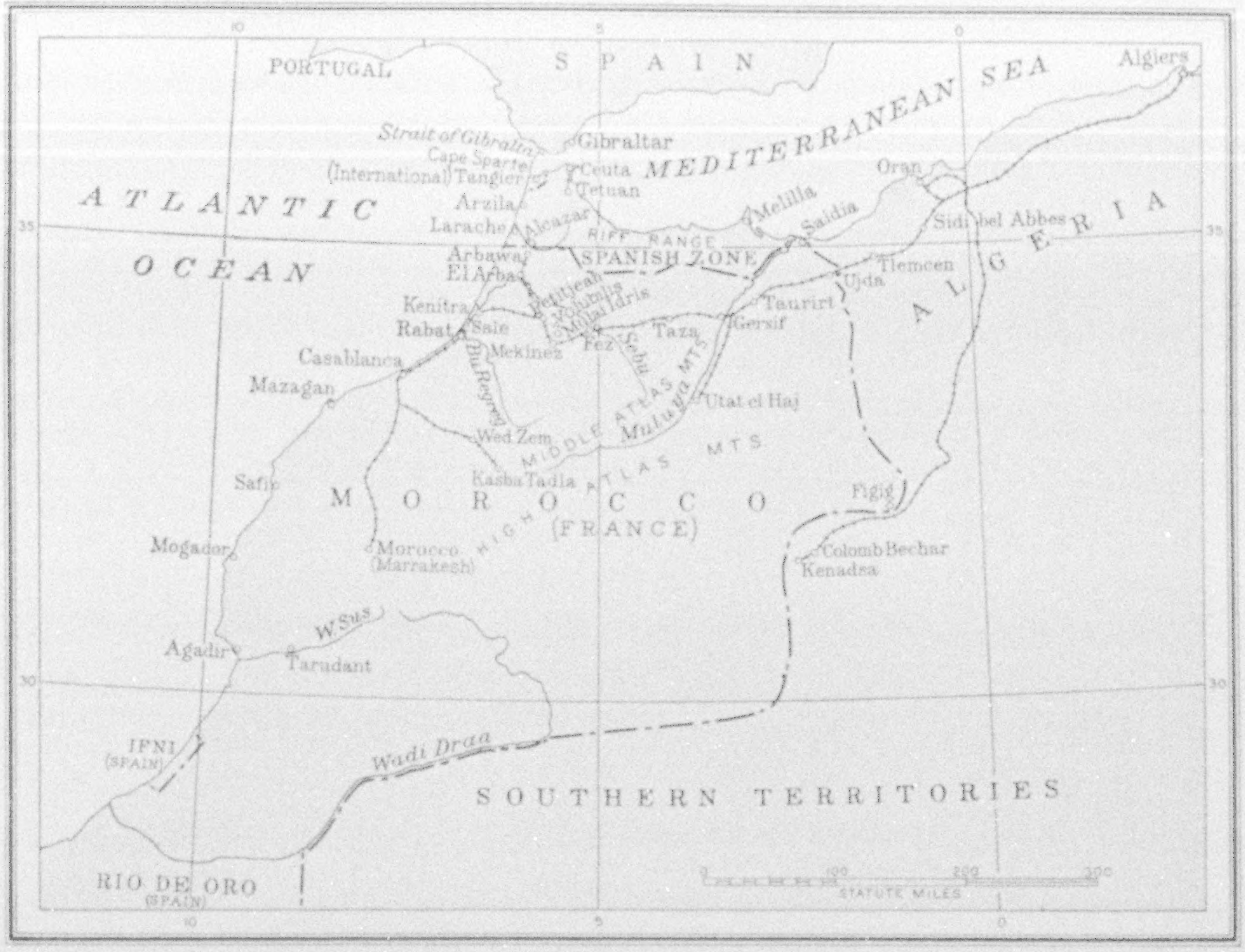
TWO TOWNS PERMEATED WITH THE SPIRIT OF HISTORY AND ADVENTURE

The two Algerian towns that stand out in my memory of that day's journey from Oran to the Moroccan frontier are Sidi-bel-Abbès and Tlemçen.

The former is one of two Algerian depots of the Foreign Legion. Here men of varying nationalities—French, British, Russian—left the train on the last stretch of their journey to join a service full of hardship and adventure. For years no other ties might claim them.

Tlemçen, although within Algerian territory, is Moorish in its history and architecture—a pure type of Islamic town. Set on a hillside 3,000 feet above the sea, surrounded by olive, carob, and terebinth trees, the native city looks down on the outspread French settlement and over the plain which stretches to the Mediterranean. Near by are strewn the massive red-walled ruins of bygone civilizations.

Here the Romans camped. From here they marched, over the road we were to follow, to found their westernmost military post and granary at Volubilis, beyond Fez. Here, nearly twelve centuries ago, the followers of Mulai Idris, founder of the first Mussulman dynasty in Mo-



Drawn by James M. Darley

A MAP OF FRENCH AND SPANISH MOROCCO

The author traveled from Oran, on the coast of Algeria, to Ujda by rail; from Ujda to Fez by motor; from Fez to Casablanca by rail, and from Casablanca, by way of Rabat, Kenitra, Arbawa, Alcazar, Larache, and Arzila, to Tangier. French Morocco is about equal in area to the State of Texas, and Spanish Morocco is the size of Massachusetts.

rocco, built a city near the deserted Roman camp.

To Tlemçen, from the west, swept the Berber hordes who conquered Spain. For this pearl of El Moghreb el Aksa, "Farthest West" of the Moslem world, the Spaniards of Oran and the Turks of Algiers fought, and the Turks won. Then came the French.

From the station in Ujda we made our way by automobile to the little hotel across the street from the "jitney" garage. We were to start at four in the morning!

AN EERIE ENTRANCE INTO OLD MOROCCO

Half a dozen small boys hung to the running board, jabbering Arabic and laying hands on our luggage. Neither Spanish nor French proved effective, but the brother-in-law of Monsieur-the-barber came to our rescue with a club.

I cannot describe Ujda. It was dark when we entered it and dark when we left it. Our start on the long day's journey was made before daylight, in a torrential downpour. No more eerie entrance into Old Morocco could be imagined. The shadowy figures passed on the highway in the gray dawn—hooded, shrouded in ghostly white, creeping along with their flocks or prodding their laden donkeys—seemed to belong to an age long past.

The realization came to me that these secluded people, who, until a few years ago, had not dreamed of a world beyond their archaic hills, nor seen a wheeled vehicle, had been brought, in one great leap, face to face with civilization in its most advanced stage—the railroad, the automobile, the airplane.

I had a feeling of gratitude that we had not come to inland Morocco too late. Here, little changed since prehistoric

XUM

days, were the ancient Berber people. Here, right in the automobile with us, were natives taking their first ride!

I have met travelers who have journeyed under more comfortable circumstances to Fez. I cannot agree with the wife of Monsieur-the-barber about her brother's automobile being *très, très bonne*. It was, in fact, the most uncomfortable and unreliable "jitney" it has ever been my misfortune to encounter (see illustration, page 343); but, to an inquiring geographer, our fellow-passengers were all that could be desired.

A MOTLEY GROUP OF PASSENGERS

On the front seat, next to the French-Algerian driver, sat a commercial traveler, a modern Jew from Oran, with whom we spoke in Spanish. He knew Arabic, but, like ourselves, was ignorant of the native Berber tongue spoken throughout Morocco. Next to him sat an altogether different sort of Jew, one of the Old Testament type, whose ancestors drifted to North Africa along with the Phœnicians, a thousand years before the birth of Christ. His name was Shimo.

Unlike the Jews descended from Spanish exiles in the days of the Christian-Moslem wars, he knew no Spanish and only a few words of Arabic. I think he spoke a mixture of ancient Hebrew and the Berber tongue. He wore flowing garments, like the Moors, but his outer cloak was dark-blue instead of the Moorish white or brown. On his head was a high, brimless, black felt cap, shaped like the red fez worn in most Moslem countries. This cap was covered with a strip of the white muslin which was also wound about his neck.

With us, on the middle seat, sat a woman traveling alone. We judged her to be a blend of French-Algerian, Turkish, and Berber. She wore European clothes, was unveiled, spoke French, and said that her husband was a merchant in Ujda. It was through her knowledge of the Berber language that we became acquainted with the three men who occupied the back seat.

They were Berbers and looked and dressed alike. Their skin was swarthy, features rather flat, eyes small and brown. They wore black pointed beards, in the Moslem fashion. Loss of beard is the greatest humiliation that can be put on a devout Mohammedan.

Their shaven heads were wound, turbanlike, with strips of creamy cloth, and flowing *djellabas* of cream-colored woolen homespun enveloped them. This hooded garment is of Berber origin. Heelless slippers of lemon-colored leather encased their bare brown feet.

They would have nothing to do with the old Moroccan Jew, whom they called "Jehudi." He was not a True Believer. He, in turn, ignored them. The two strange foreign ladies they called "N'zrani" (Nazarenes) and seemed greatly to admire my sister's golden-brown hair.

They told the lady from Ujda that this was their first motor ride; that they liked it, but wished they were in front, where it was easier to jump out.

Language may be the closest link toward better acquaintance; but when a laden automobile skids into the ditch there is no further need of formality. We met with three such experiences between Ujda and Taza, where the splendid metaled highway begins. Up to this point we followed the *piste*, or dirt road—in reality nothing more than the old caravan trail, widened and somewhat improved.

TRAVELING SAFELY ALONG A LANE BETWEEN HOSTILE TRIBESMEN

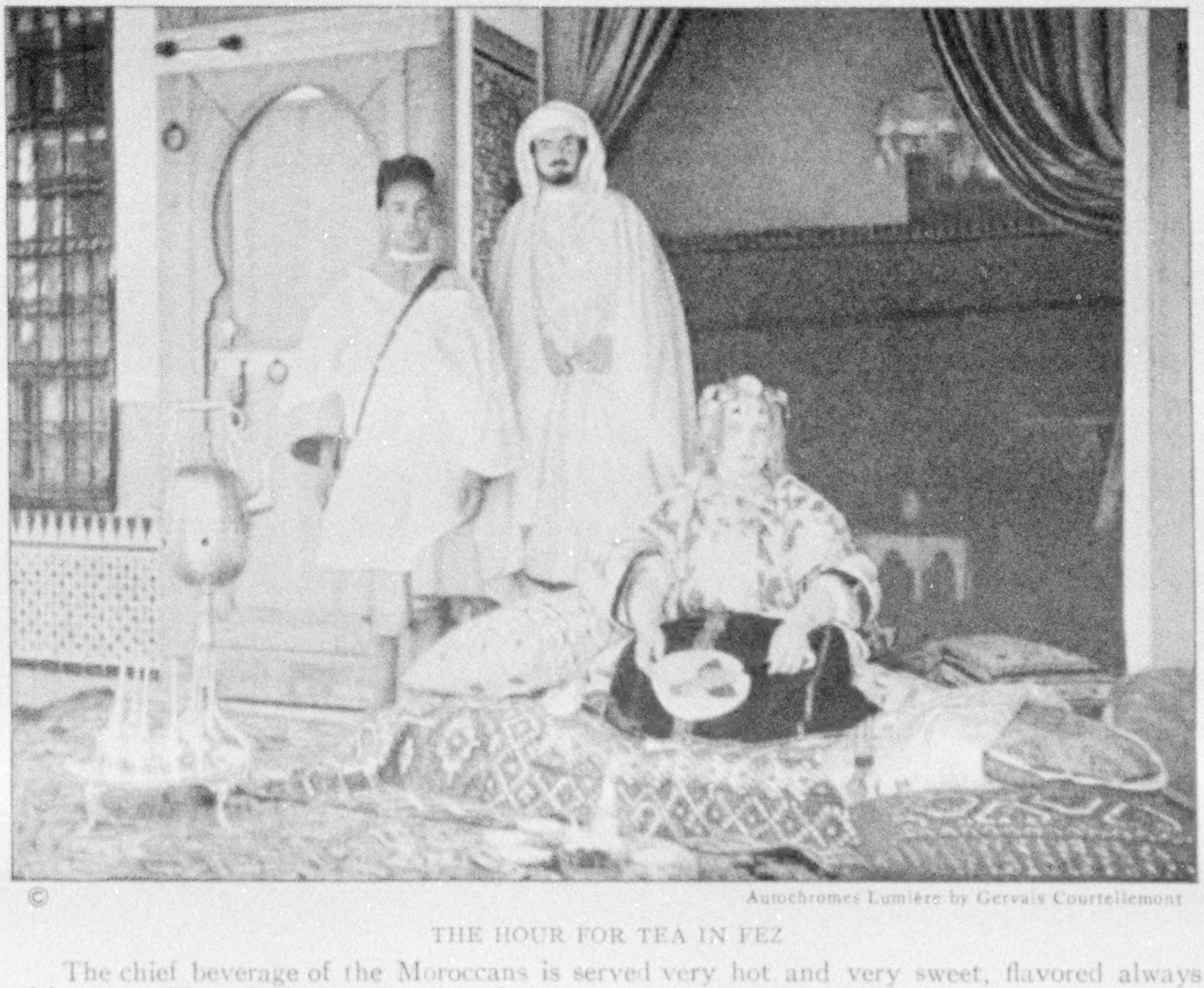
We were crossing a newly conquered country. The road parallels the narrow-gauge railway which brings the soldiers to the forts along the line. These little white forts, guarding highway and railroad, are placed at regular intervals, with larger garrisons between.

Some 30 miles to the north are the rebellious Riff tribesmen, not yet subdued by Spain (see page 355); some 30 miles to the south are the remaining Berber tribesmen, not yet on good terms with the French; yet through this narrow lane, between enemy lines, the traveler can go in safety—that is, if he chooses a good automobile and a careful driver.

Fortunately for us, the dirt road, very muddy and uneven that day, merged with the hard, rough desert. When we came to grief in the mud, we took to the desert. It was not the type of wilderness we had pictured, of sand dune and mirage. This lies beyond the Atlas. Here were cacti

WHITE TANGIER FRAMED BY A COBALT SEASCAPE

Phoenicians, Carthaginians, Romans, Arabs, Portuguese, English and French have occupied this, the oldest place of recorded habitation in Morocco. It is extremely difficult to take "snap-shot" natural-color photographs, but the sky was so clear here that the camera artist succeeded in making this instantaneous exposure from his steamer.



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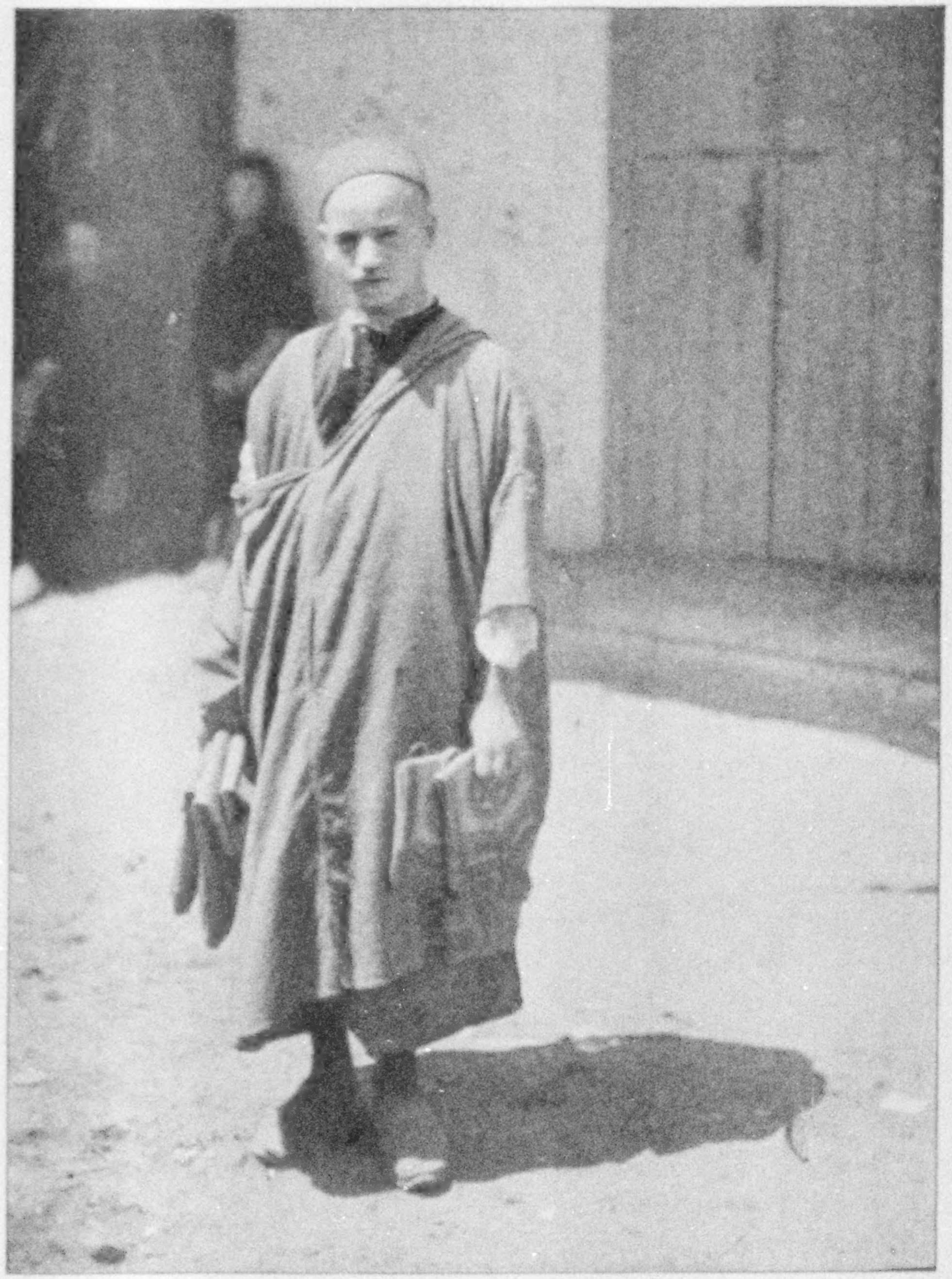
THE HOUR FOR TEA IN FEZ

The chief beverage of the Moroccans is served very hot and very sweet, flavored always with mint. The principal native dish of the country is *couscous*, a kind of dry porridge made of ground wheat stewed with mutton or chicken and pieces of pumpkin.



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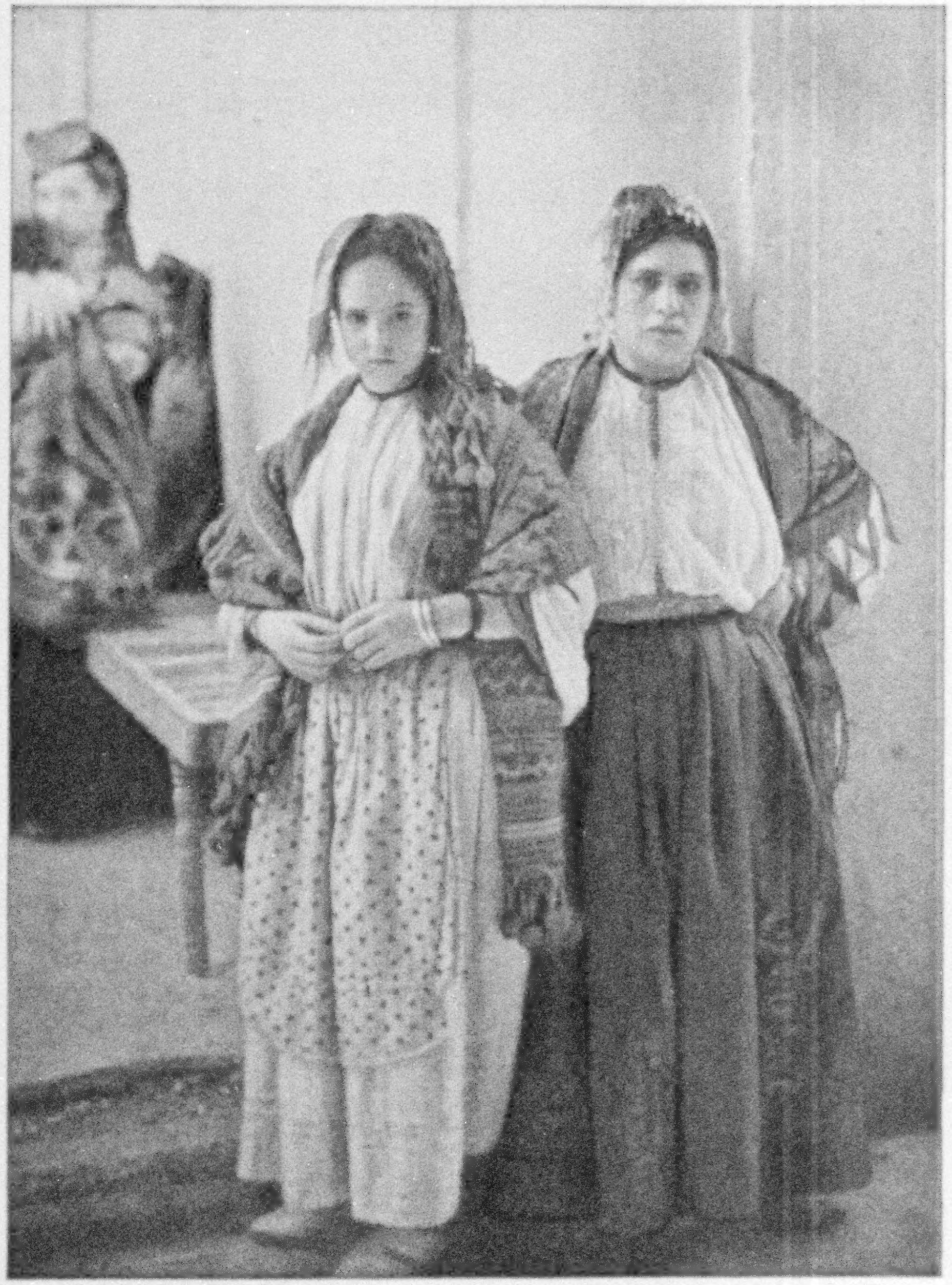
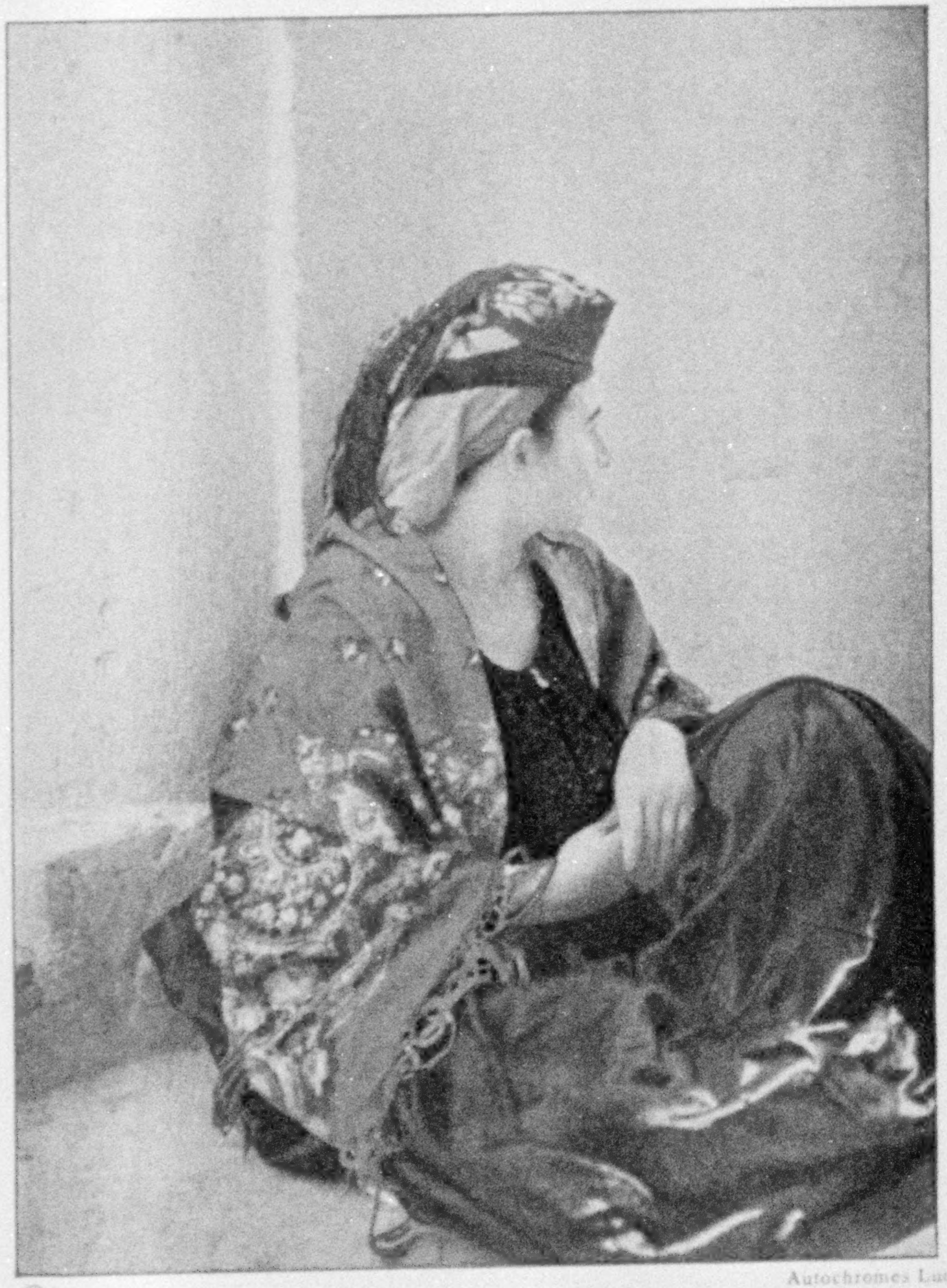
A LEATHER MERCHANT OF RABAT

Morocco has given its name to a fine quality of goatskin which is tanned with sumac or subjected to chrome tanning and dyed on the grain side. The process is supposed to have been invented by the Moors. The famous Cordova leather of Spain is also a Moslem industry.



JEWISH WOMEN OF FEZ

The shawl, a badge of the Jewish woman, is frequently costly, an heirloom coming from the Far East. This mother and her daughter wear no stockings, but their feet are incased in the heelless leather slippers which are worn throughout Morocco.



© A MOROCCAN DAUGHTER OF ISRAEL

There are two types of Jews in Morocco—those whose ancestors came from the East in early Semitic invasions, and those descended from the Jews of Spain who reached Africa when and after the Moslems were expelled from Europe. These latter speak an ancient Spanish dialect.

Autochromes Lumière by Gervais Courtellemont

A BERBER MAID FROM THE ATLAS MOUNTAINS

The Berbers are the original Moroccans, who were driven into the mountains by succeeding invaders—Phoenicians to Moslems. This young girl is wearing a white woolen homespun garment, and her people's traditional headdress which suggests the casque of the ancient Greeks.

A JEWISH CLOTH MERCHANT OF FRENCH MOROCCO

It is estimated that the Jews of French and Spanish Morocco number only about 150,000, but they play an important part in the life of both countries, for they are the chief merchants and money lenders of the cities.

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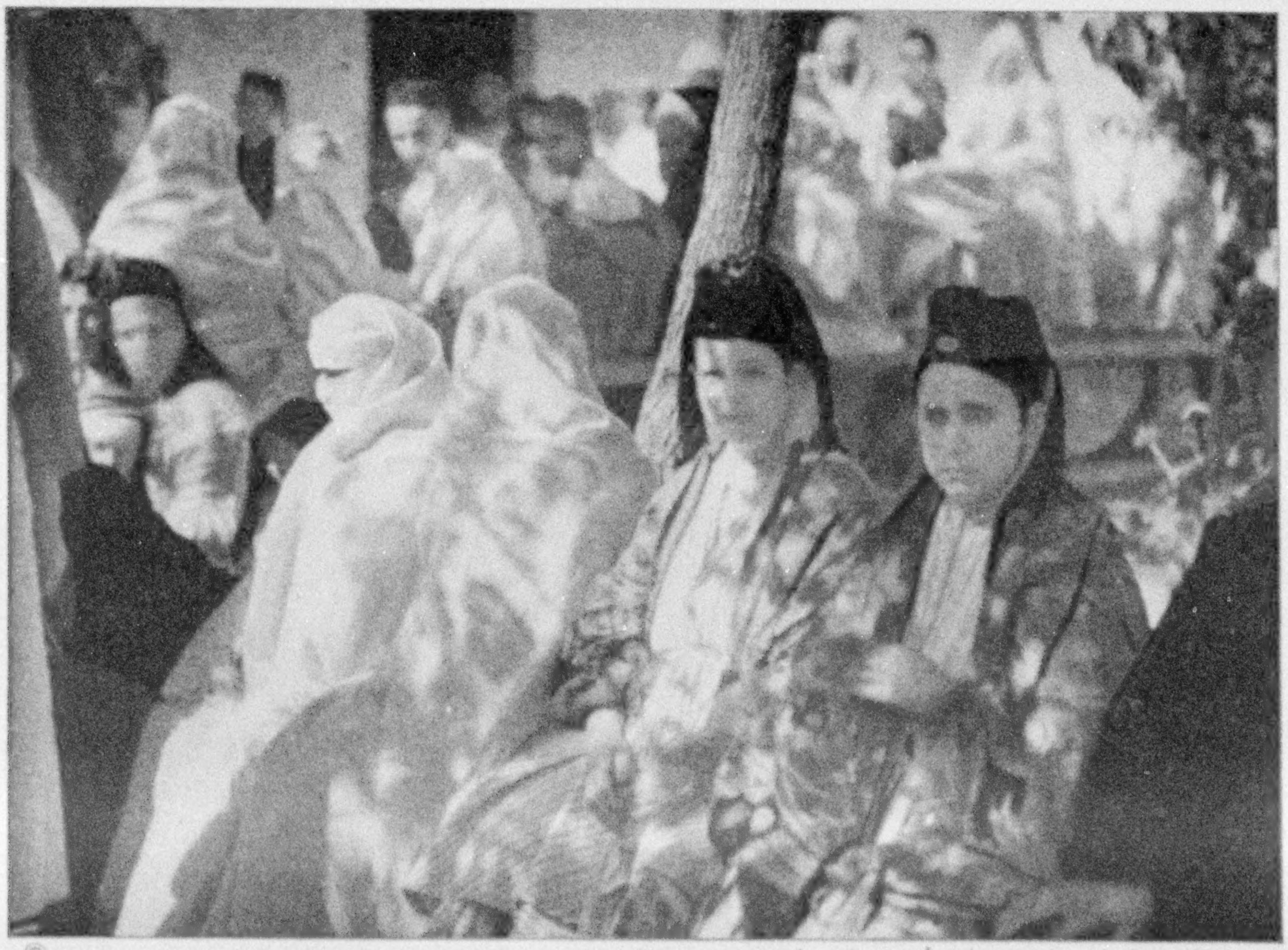
PRESIDING OVER A SAMOVAR IN MARRAKESH

French Morocco boasts four capitals—Fez, Mekinez, Marrakesh and Rabat—in each of which the Sultan has a palace. The seat of government, however, is at Rabat.

APPRENTICES IN ILLUMINATION

In this native school of arts and crafts, in the old Moorish quarter of Rabat, children are taught to paint the old Arab designs, familiar in Granada and Seville, in gold and blue and vermilion.



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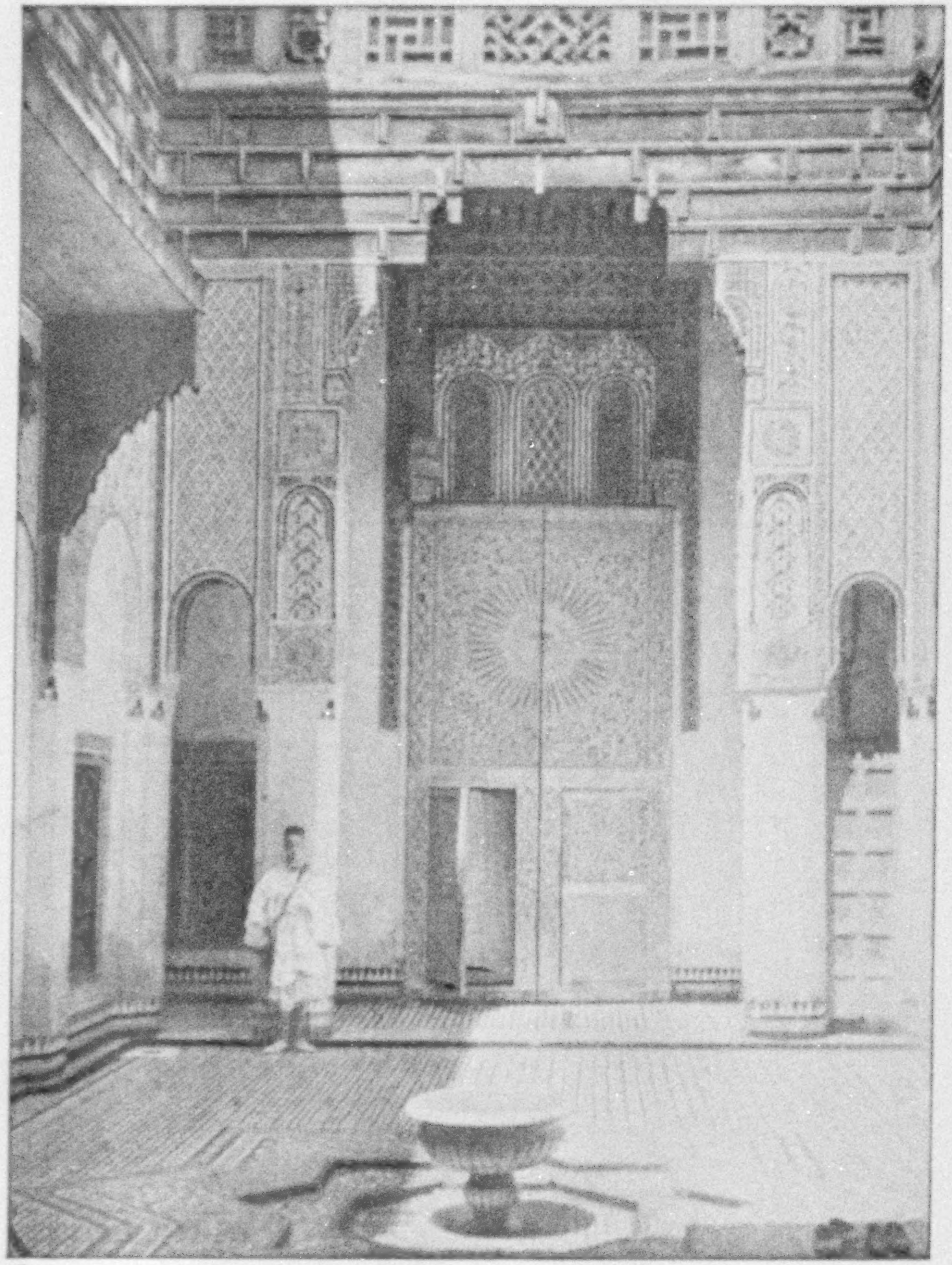
JEWISH AND MOSLEM WOMEN AT THE FEZ HOSPITAL DISPENSARY

While the Moslem women are veiled, the Jewish women invariably cover their heads. Beneath the white woolen outer garments of the former, bright-colored cotton gowns are worn.

XUM



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THE TOWN PALACE OF A LORD OF THE ATLAS

The French have permitted several powerful chieftains of mountain tribes to live in regal splendor in Fez and Marrakesh, while they retain control of their followers. The fountain shown here is similar to those found throughout Moslem Spain.

MUSICIANS AND DANCERS AT A BANQUET IN FEZ

Besides the oriental dances, given to the accompaniment of violin, lute, tambourine, flageolet, flute and drum, there are occasionally graceful sword dances by barefoot highland Berber girls. Note the superb mosaic tilework here and in the illustration to the left.

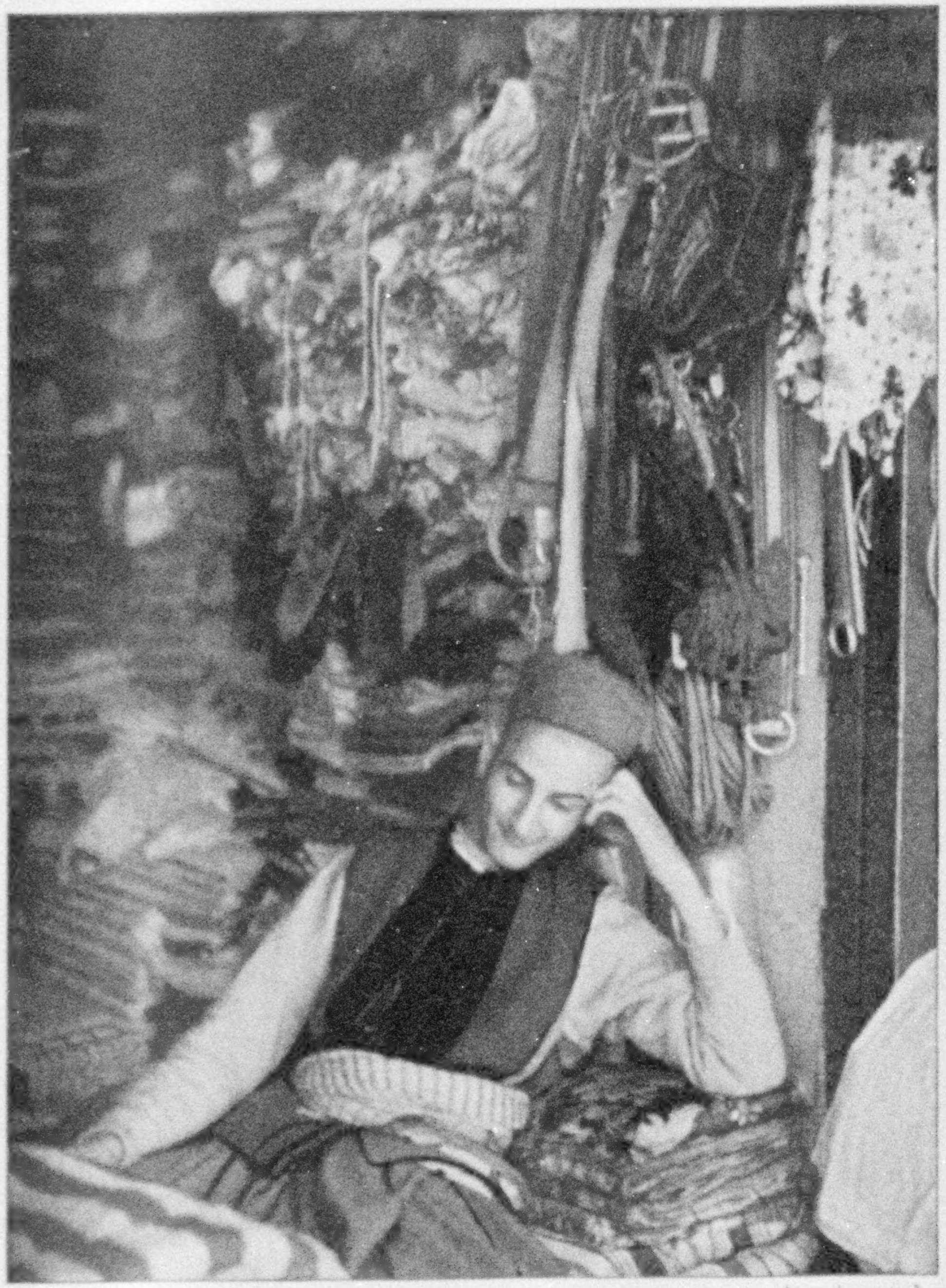
© AN ARABIAN-NIGHTS TYPE IN MOROCCO

Like the snake charmer, the sweetmeat seller, and the musician, the story-teller is a part of Eastern life which has a strange fascination for the Westerner who lives in Arab lands.

Autochromes Lumière by Gervais Courtellemont

A RABAT DYER OF RUG YARN

The colors of the famous Rabat rugs are burnt orange, mahogany, brown, green, a little cream and dark coral. The floors of the mosques are carpeted throughout with many rugs.



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A LANGUID MERCHANT OF CASABLANCA

His shop is a mere cubby-hole in the wall, set waist-high above the street. He sits cross-legged by the hour among his wares—cinches for horses, saddle blankets, rainbow-hued silks and gay-colored cotton cloth.

A JEWISH CLOTH PEDDLER

Before the French came to Morocco, the Jews were compelled to show their subjection to the ruling race by their dress and were required to take off their shoes whenever they passed a saint's tomb.

and a scanty vegetation on which gaunt camels grazed.

These single-humped Arabian camels are not the "oldest residents" of Morocco. They followed the Arab invasion westward twelve centuries ago. Before their coming, the domesticated ass was the Berber's only beast of burden. Long years before the birth of the Great Camel Driver who gave to the Moslem world its faith, long years before the Three Wise Men journeyed to Bethlehem, Berber farmers here drove their asses to market and Berber shepherds here tended their flocks.

SHEPHERDS WEAR LOCK OF HAIR AS PASSPORT TO HEAVEN

At our first breakdown on the lonely road, out of sight of forts and soldiers, we were surrounded by these primitive plateau people. Not yet arrived at the opulent state of their countrymen on the back seat of the automobile, these poor shepherds wore brown homespun djellabas, ragged and soiled. Although nominally Moslems, wearing the usual prescribed head-covering, their women were unveiled.

The faces and ankles of these Berber women were tattooed. They were taller and leaner than their harem-bred sisters whom we later met in the cities where Moorish beauty runs to avoirdupois.

The heads of the young boys were uncovered, showing a long strand of hair on the otherwise shaven head. By means of this strand, the Jew from Oran informed us, the Faithful are jerked up to heaven.

We passed the homes of these shepherds—low black cloth tents of woven camels' hair surrounded by thorny brush walls. At night the sheep, goats, and donkeys are brought within the inclosure.

In Morocco there are more sheep than people. Barbary flocks are not driven, as in most parts of the world, but follow the shepherd, who calls to his sheep as he would call to little children. Perched on rocks, with their flocks about them, the half-clad Berber boys play the most mournful tunes imaginable on their ancient pipes.

At the village of Taurirt we had coffee at a café kept by a Frenchman. A starry-eyed, tame gazelle, called "Bizette," followed him about the room. The Atlas Mountains are still a haven for many wild creatures. Here roams the pale-brown aoudad, intermediate between sheep and goat, with big, wild eyes, large horns curving backward and downward, and long whitish hair drooping from throat, chest, and forelegs.

We crossed the broad Muluya River on the railroad bridge. Morocco is drained in three directions. Rivers, whose headwaters in the Atlas are within a limited circle, flow to the Atlantic, the Mediterranean, and the Sahara, the last-named streams being lost in the thirsty sand. The Muluya flows northeast from the Atlas to the Mediterranean, where it forms the boundary between French and Spanish territory.

Like the Sebu River, flowing from Fez to the Atlantic, it can be canalized, a French engineer told me, over much of its course. The French are negotiating with the Spanish in regard to the building of a port near the Muluya's mouth.

THE GIANT-FRAMED SENEGALESE ARE ENCOUNTERED

Near the village of Gersif (Guersif) we met the first of the Senegalese troopers. Of all the soldiers of France's mighty colonial army—Frenchmen, *Légionnaires*, Arabs, Berbers, and black men from many an equatorial clime—none are braver than these giant-framed ebony-skinned men of Senegal. Within the walled military inclosure at Gersif we saw the dwellings of these warriors—circular adobe huts with conical thatched roofs, not unlike the sort they have at home.

On the white wall of every fortified railroad station along this route two signs, in large, black letters, point the direction to the "Ville Indigène" and the "Ville Nouvelle." It is thus, from the first, made apparent to the traveler that the French have built their towns *outside* the native villages. They are not interfering with Moslem architecture, religion, or customs. They have built railroads and highways; have fortified those regions unsubdued even in pre-French days; have erected hospitals and schools; but Mussulmans and Jews are kept apart

Photograph by Frederick Moore

MAKING DAY HIDEOUS WITH HIS HOWLS: A SINGING MINSTREL OF MOROCCO

in the hospitals, the schools are on Moslem lines, and even the courts of justice are administered, under French supervision, by native pashas.

In Morocco a Pasha dispenses secular justice in a city, a Kaid governs a tribe, and a Kadi administers the Moslem law based on the Koran.

"The Moors are not an inferior, but a different, race from the French. We want them to become good Moors, not poor Frenchmen," Marshal Lyautey, Resident-General of Morocco, has said; and "Lyautey Africanus," as an American statesman once called him, is the very soul of this French Maroc.

From Gersif the road climbs to the terraced hill town of Taza, boldly commanding the Touahar Pass, the natural eastern boundary of Morocco, which looks a little like the Khyber Pass, between the Northwest Frontier Province of India and Afghanistan.

Like the Khyber, this pass has known hard fighting. Men of the Stone Age fought here, and men of the Bronze Age. Here marched the Roman legions. Here through the centuries flocked the Berber hordes, swaying east and west.

Twenty years ago Taza was the headquarters of Bu Hamara, a fierce bandit who held out against the Sultan. In Fez I saw the small cage in which he was exhibited on a camel's back, between his capture and his death, throughout the neighboring country.

At Taza, in the spring of 1914, the French forces from Fez met the French forces from Algeria and the tricolor waved across North Africa.

A SPLASH OF WHITE—THE HOLY CITY OF MOROCCO

The beautiful part of our day's journey was from Taza on. The blue Riffian hills to the north were without snow, but to the south the peaks of the Middle Atlas lifted their crystal-crowned heads to the cobalt sky. In the emerald bottom lands below the road sleek cattle grazed. Far ahead, on a distant hillside, we saw, through the twilight haze, a splash of white. It was our first glimpse of Fez.

I have seen strange and fascinating cities—kaleidoscopic La Paz, on the roof

Photograph by Harriet Chalmers Adams

UJDA TO FEZ BY AUTOMOBILE

In addition to the author and her sister, the car, which was driven by a French-Algerian chauffeur, had as passengers a modern Jew of Oran, another Jew of the Old Testament type, a woman traveler of French-Algerian, Turkish, and Berber blend, and three Berber men.

of the Western World; remote inland towns of Asia, Moscow in pre-war days, and many another ancient mart—but none is more alluring to Western eyes than this long-hidden Holy City of Morocco, seat of Moslem learning for more than 1,000 years. I am glad I saw it in springtime, when it lay like a pearl on the slopes of the velvet-green hills.

Fez is a compact, white-robed city of uneven flat roofs and unexpressive walls. From among these roofs rise the minarets of the mosques, which here are not slender, round towers, like those farther east, but square in shape, like the well-known Giralda of Seville. It is the great crenelated outer ramparts surrounding the city which give to it, and to every Moroccan town, that air of enchantment and mystery (see page 344).

Shading in color from terra cotta to ocher, nearly golden in some lights, interrupted by massive watchtowers and by an occasional gatetower with a horseshoe arch, these immutable walls of Old Fez fascinate the Westerner, lingering in the memory after other more animated scenes have faded.

Breaking the monotony of these walls within walls, built in days when Moroccan cities were perpetually menaced, are the smiling fields and gardens which encircle the town and the glimpses of secluded gardens within, where cypresses, pomegranates, apricots, and oleanders shade the jasmine and the rose.

DARK TALES ARE TOLD OF FEZ

I shall always connect this curious city with the sound of running water. Through it, and under many of its streets, rush mountain torrents. In the eyes of the Moor still water is unclean. The remarkable drainage system under the town is said to have been the work of a French renegade who lived here at the close of the eighteenth century. Dark tales of other days are whispered—a lid in the conduit lifted, a thrust—who knows!

Fez has four distinct divisions: the Medina, or native town; the Mellah, or Jewish quarter; the Sultan's palace and

Photograph by Captain Paul Martel

A VIEW OF OLD FEZ TAKEN FROM THE TOMBS OF THE ANCIENT MERINIDE SULTANS

To the north of the city are great sections of reddish ruined walls, ancient ramparts built in the twelfth century. To the right is the minaret and square-pointed roof of the mosque venerated throughout all Morocco, the Mulai Idris. To the left the minaret of the Mussulman University of El Kairouine, celebrated throughout North Africa.

grounds; and the new French city outside the walls.

The native city is divided, in turn, into Djedid, the upper town, and El Bali, the lower, older section. In Djedid are palaces and gardens, some abandoned. One of these palaces is now used as a French hotel.

El Bali is a labyrinth of dark lanes flanked by buildings windowless save for barred slits in the upper stories; and crowded alleys, roofed with reeds and palm branches (see page 345), where merchants sit, cross-legged, in cubby-hole bazaars waist-high above the street, smoking *kief* in long reed pipes.

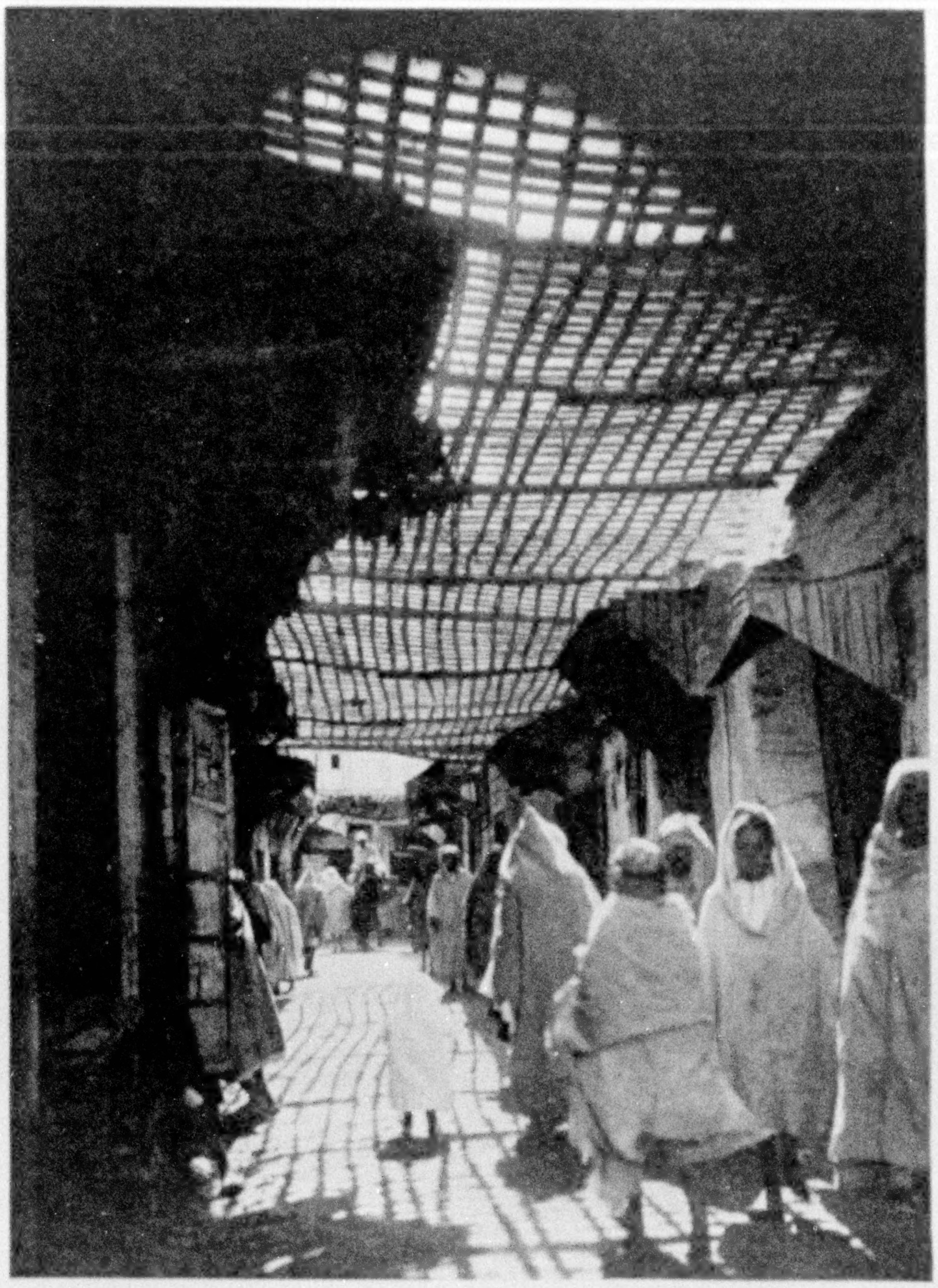
Here are the mosques and the *medersas*, or preparatory schools with dormitories for students, built over small mosques, higher Mohammedan education being received in the large, main mosque.

While travelers in Morocco may not

enter the mosques now open to them in Algeria, they may see in the medersas the beautiful Moslem architecture at its best. In Fez there are four of these old buildings dating from the fourteenth century, and a fifth, of a later period, which is also a jewel.

For nearly 1,200 years Moslem art, over a vast territory stretching from the Far East to Morocco and Moorish Spain, has been essentially the same—simple of outline, with decorations in complicated geometrical design, since the Moslem faith is prejudiced against the representation of any form of life.

All Moroccan mosques, medersas, homes, shops, and cemeteries look more or less alike, forming an incomparable setting for a people whose dress, regardless of station, is alike in form and coloring. It is, I think, this whiteness and sameness which give to the cities of Morocco, no matter how thronged their streets, an air of quietude.



Photograph from Joseph Bouhsira

A SHOPPING STREET IN THE HEART OF OLD FEZ

The roof, designed to minimize the severity of the sun's rays, is a lattice of reeds. The booths of the merchants are cubby-hole bazaars on each side of the narrow thoroughfare. On some of the streets of Fez horses and mules are allowed, on others only pedestrians. This is one of the former, as shown by the well-to-do individual in the distance, who is mounted.

Only the motion picture can bring before one the never-ceasing human tide which flows by day through the narrow, crowded streets of Fez. The Moors, who number, in the French and Spanish zones, about 6,000,000, are a mixed race with a Berber base. This base we shall find, if we dig deep enough, to be white, allied to a prehistoric race of southwestern Europe. There are many admixtures—Arab, Jewish, Turkish, European. And there is also Negro slave blood from the far south.

Some of the aristocratic types are striking—men of white skin and noble mien, whose flowing robes lend a certain grace and dignity.

We pass a rich man astride a white mule. His high Moorish saddle looks uncomfortable, but the bright-red saddle-cloth and woven bridle are most pleasing to the eye.

Balek! Balek! ("Look out! Take care!") shouts the poor man on foot, as he beats his wretched little donkey into the thick of the crowd.

A MEDICAL MISSIONARY TALKING WITH A BOY OF FEZ

The European woman has conformed to the Moslem custom by wearing a white *djellaba*. The boy carries a bowl of couscous, a favorite food in Morocco (see also Color Plate I).

The upper-class women rarely venture out. Theirs is a walled life, illuminated by the joy of motherhood and the companionship of sisters in seclusion. The faces of the muffled women seen on the streets—servants, household slaves, wives of poor men—are veiled. Between bands of white, two dark eyes gleam out; or else the veil is so drawn that only one long-lashed eye remains uncovered. These women, barelegged like the men, shuffle along in heavy-soled, heelless slippers.

In marked contrast to the people seen in the Medina are those of the Mellah—sly, furtive old Jews in black gaberdines and skull caps, modern Jews in European clothes, fat old Jewesses wearing frayed Persian shawls, bright-faced, creamy-skinned young Jewesses with big, black eyes, their heads wrapped in gaudy silken scarfs. To these the coming of the French meant the end of long years of oppression.

To the Mellah the traveler goes for post-cards and photographs, to have films developed, to look for the odds and ends needed in traveling. There are few curios to be found here save exquisite bits of filigree of ancient design in the dingy little shops of the goldsmiths.

THE HOME OF THE RED FELT FEZ

We must go back to the native town for the silk embroideries for which Fez is noted. Here, too, are manufactured saddlery and leather slippers, musical instruments, a crude painted pottery and glazed tiles like those the Moors gave to Spain. The French are reviving these native crafts, along with the matting of Salé, the rugs of Rabat and the Berber villages, and the brassware of Marrakesh (see Color Plates II, V, and VII).

Until recent times Fez had a monopoly on the red felt caps which bear the city's name. I was told that in the old days the carmine dye for these caps was obtained from the juice of a Moroccan berry. Nowadays fezzes are also manufactured in Turkey and in France.

To the royal palace the reigning sultan, Mulai Yusef, comes but seldom from his more modern abode, beside the home of

the French Resident-General in Rabat. Women of his harem live behind these moldering walls.

A NESTING LAND FOR STORKS

On all these massive Moroccan walls storks, in nesting time, hold sway. I saw their brushy nests, too, on the thatched peaked roofs of mud huts throughout the country, as many as fifty nests in a village of twenty huts. The natives love and cherish these big, friendly birds. The annual migration brings the storks north from South Africa to southern Europe in the early spring. Thousands fly no farther than Morocco. The young hatch earlier here than in Spain. In the meadows where cattle graze I saw many small white egrets, also migratory in North Africa. They follow the cattle, feeding upon insects disturbed by them, often perching on their backs.

Photograph by Captain Paul Martel

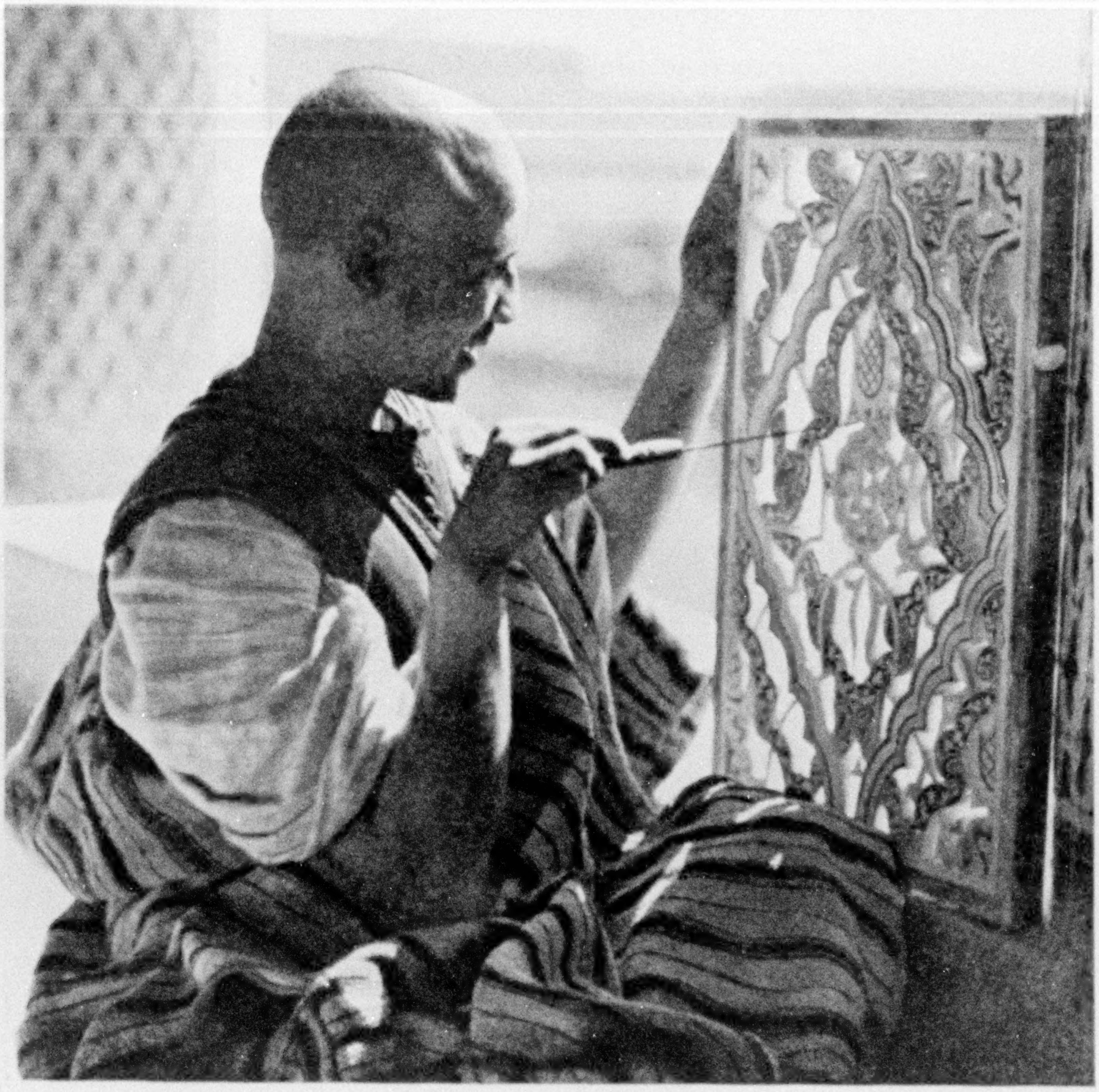
A MARRIED WOMAN OF THE ARISTOCRACY OF FEZ

She wears a gold diadem and headpiece, precious stones and pearls. On the sides of the face are nets of fine pearls; on the breast are collars of pearls, with large emeralds. Her gold collar has pendants of precious stones; her silk belt is embroidered in gold, with a snap buckle of gold and precious stones, and the dress material is of cherry-colored silk worked and embroidered in gold. Both jewels and dress are sometimes rented or loaned by parents or friends. Their weight is so great that the bride can stand only a few minutes at a time and she cannot walk. The value of the ornaments and dress shown in this picture has been estimated at two million francs.

In the French quarter of Fez one sees the attractive modern Franco-Moorish architecture which has reached its glory in Rabat, capital of the Protectorate, on the Atlantic coast. During the early years of French occupation structures in Casablanca, the first city built by the French, were on European lines, unsuited to the climate and a blot on the Moorish landscape. Since then a new architecture—beautiful, suitable, blending well with the pure Moslem—has been evolved.

The French in Morocco have had to build extensively—administrative buildings, post offices, barracks, railway stations, warehouses, hotels, shops, homes. A Fine Arts Commission supervises all buildings and grounds.

The buildings, always white, are usually of two stories, with walls of concrete or soft native limestone. There are broad windows instead of the blank Moslem walls. There are arcades, patios, col-



ELABORATE PLASTER ART WORK FOR THE SULTAN'S PALACE AT MARRAKESH

umns, and arches. Color is introduced in bands of glazed tiles, blue predominating. The effect is one of space, beauty, comfort.

Some day, when the newly planted semitropical gardens have growth and bloom, these artistic, yet substantial, buildings will form a pleasing background for a perfect riot of color.

To the student of Spain and Portugal and Latin America, Morocco is a golden link in history's chain. Constantly I was reminded of all that the Moors gave to the Iberian Peninsula in architecture, arts, language, customs, flora. I could not, on the other hand, trace much of Spanish or Portuguese influence back to Morocco, whence Moslems fled after each Christian victory. To Fez from Granada, after the final expulsion of the Moors, came Boabdil, last of the Moorish rulers of Spain, to live on for more than 30 years.

FINER RAILWAY COACHES THAN ANY SEEN IN EUROPE

From Fez the trail reaches Mekinez in two hours by perfect motor highway or by broad-gauge railway, with finer coaches than any I saw in Europe.

It is the situation of Mekinez that places it among the unique cities of the world. We arrived after nightfall and drove what seemed to be an interminable distance to the hotel, which was, the coach driver explained, on the edge of the French settlement overlooking the native city. At last he rang the bell at the hotel

Photograph by Captain Paul Martel

AFTERNOON TEA IN A MOSLEM CEMETERY OUTSIDE THE WALLS OF FEZ

Friday is the day given over to Moslem women in the cemeteries of Morocco, and no man is supposed to enter the inclosure until late in the afternoon, after the ladies have departed. The women bring flowers and food to place on the graves and they make a sort of picnic holiday of the occasion, which varies the monotony of their shut-in lives.

gate and two Moorish house-boys wearing baggy, white knee breeches, green silk sleeveless jackets over white shirts, white aprons, and the customary red fezzes, came down, with a pleasant French greeting, to receive us.

When we looked from the window next morning, all Mekinez lay below us across a deep canyon—an oblong white city within its surrounding walls. The sunlight sparkled on the bluish-green tiled domes of the mosques. I counted 15 minarets.

Beyond the white town we saw the Cyclopean red walls of an older city stretching for miles across the flower-spangled plain, the city built by the arrogant Sultan, Mulai Ismail, who died in the early years of the eighteenth century, after a reign of 55 years, father, we are told, of more than 800 children.

HORSES THAT CARRY THEIR MASTERS 100 MILES A DAY

Hearing of Versailles and the pomp of Louis XIV's court, Mulai Ismail tried to rival it. Thousands of Christian slaves toiled on walls and palaces. The royal stables are said to have held 12,000 horses.

The French are now using these long-abandoned inclosures for practical purposes. There is a museum in the Sultan's palace. The old gardens bloom again. At the stock farm we saw spirited cream-white Arab horses, associated in Western minds with the Moors, who gave this noble strain to Spain.

"Wonderful horses throughout the country," a French enthusiast told me. "From here the Romans recruited their famous cavalry. Across the Atlas there's a breed, known as 'wind drinkers,' that hunt the ostrich and carry their masters 100 miles in a day."

Within the inclosure of the French hotel grounds at Mekinez is a small white-domed building, the shrine of some dead saint. Here an old *Marabout* (holy man) lives. I saw an old woman climb up the steep path from the highway to sweep out his shrine, and an aged man bring him food. Such shrines and such

BRINGING A WESTERN SEWING MACHINE TO THE HAREM: CASABLANCA

Casablanca, having more European residents than any other city in Morocco and being the first to receive Western innovations, is the one where the sewing machine more easily finds a place in a Moslem home. The men are the tailors here rather than the women. The woman carrying the machine is a servant.

Photograph by Harriet Chalmers Adams

A SOFT-DRINKS AND LUNCH COUNTER AT A WAY STATION ON THE MEKINEZ-RABAT RAILWAY

There are first-, second-, and third-class accommodations on this line, and, as the natives love to ride, the third-class coaches are always crowded. This vender has discarded native dress for European clothes, except for the turban. He had been a soldier during the World War and asked the author about a number of French towns with which he was familiar.

holy men are to be seen throughout Morocco.

The Moors are very fond of using nicknames, not only among themselves, but especially when speaking of Europeans, whose names are unpronounceable and difficult to translate into Arabic characters. These nicknames are usually based upon some physical peculiarity; hence, "Lord Deaf Man" and "Lord Lame Man." A British resident in Morocco, whose wife addressed him in terms of endearment, was always called "Mr. Dearie" by the native cook.

I remember Mekinez at sunset—a narrow white town backed by those flamingo-fringed clouds which are the glory of this country; again, of almost supernatural beauty, under the glowing stars.

ROMAN RUINS BEING UNEARTHED

Not far away, among the silent Zerhoun hills, are the ruins of Roman Volubilis, where French archeologists are piecing together fragments of stories in stone. While not as imposing as the Roman ruins of eastern Algeria or Tunisia, Volubilis and other sites nearer the Atlantic speak of those days when Mauritania was more than a name on the map.

There is a forest of cedars and oaks east of Mekinez and a forest of cork oaks between that city and the coast. These and the argan forest back of Mogador are the only trees on the wide Moroccan plain tilting upward from the Atlantic to the Atlas Mountains. The people call this unforested section the Bled (see also text, page 287). In spring great stretches of purple iris and countless marsh-loving birds beautify it, but to the men who cross it with their swaying camels and pattering donkeys, under the burning African summer sun, it must seem a dreary waste.

The French are reforesting the hills, taming the rivers, and building irrigation ditches, as in Algeria. Pine logs cut in the Atlas are floated downstream to the sea.

The cork oaks of Morocco, ruthlessly destroyed in the past, are like those in the Iberian Peninsula. Last autumn the United States made its first direct purchase of Moroccan cork. The argan tree is in a class by itself—gnarled, twisted, limited in habitat, a survivor of an age before the desiccation of the Sahara. It looks a little like the acacia and produces a nut about the size of an olive, from which oil, used by the natives in cooking, is extracted.

From Mekinez and its neighboring villages we went on to Rabat. This was not my first visit to Moroccan coast towns, and I found many changes after an absence of 12 years. The twin cities of Rabat and Salé are separated by the wide Bu Regreg River, "Father of Glittering" (see also page 287 and illustration, page 300). The one, with its great citadel mounted proudly on the cliff where the river meets the sea, now merges into the progressive French capital. The other, quiet and white as a snowdrift, beside the restless gray ocean, is little changed since those adventurous days when it harbored the fierce Barbary pirates known to Britons as the "Sally Rovers," who plundered the coasts of southern Europe, sailing as far north as the British Isles.

Many an unfortunate Christian captive came in chains to Rabat and Salé over the foaming river bar.

This inhospitable West Coast is without natural harbors, and the French have spent a small fortune on the port of Casablanca, an hour's ride south from Rabat. This city, the second in size in the country and the home of most of the European residents, is the economic center, just as Rabat is the administrative base.

It was here, in 1907, under a dying dynasty, that the French occupation of Morocco really began. It was not until 1912, after native soldiers had massacred their French officers in Fez, that Marshal (then General) Lyautey was appointed Resident-General. Marching to Fez, which was besieged by 20,000 Berbers, he and General Gouraud drove away the rebels. That Morocco was held and pacified during and in spite of the World War is one of the greatest of military achievements.

FROM SOUTH OF CASABLANCA COME THE VAUDEVILLE ACROBATS

South of Casablanca, by sea boulevard, lie Mazagan and Safi, rich in Portuguese associations, with crumbling fortresses built 400 years ago, when Portugal was the greatest maritime nation in the world, with trading posts far down the West African coast.

Photograph from Willard Price

A WATER VENDER OF MEKINEZ

As he makes his way through the crowded streets ringing his bell, the merchants, who cannot leave their wares to go to the drinking fountain, buy his none-too-clean water from the goatskin bag on his back.

The French have built motor roads over the Atlas. Even Veiled Tarudant, in the valley of the Sus, will soon be accessible to the traveler.

Barley, wheat, beans, camels' hair, hides, skins, almonds, and beeswax are some of the products brought out by camel caravan and donkey train from inland Morocco. There are 100,000 camels in the country.

Cattle are shipped in great numbers to Portugal; sheep to Spanish Morocco, Spain, Algeria, and France. Both mutton and wool are becoming short in France.

Moroccan hens must be very industrious, for incredible numbers of eggs are annually exported. One of the chief imports is tea, the national Moroccan beverage, served very hot, very sweet, and flavored with mint.

"I want to cross them mountains," a queer American tourist coming out of Marrakesh said to me, "and see the tents of the *A*-rabs!" When he goes I hope he will not flounder as hopelessly in Saharan sands as he has in the Moroccan racial maze.

The ghosts of gallant *fidalgos* seem to haunt these noble old battlements.

Mogador, south of Safi, is the gate of Marrakesh, the largest city of Morocco, now reached by rail and highway—beautiful palm-fringed, red-walled old Marrakesh at the foot of the High Atlas, more African in character than any of the other cities I have named. To it come jaded camel caravans from the Sahara, and strange, untamed men from the Dráa, the Ziz, the Gir, and the Sus, those little-known fertile valleys on the other side of the mountains.

From the Sus come the acrobats famous on the international vaudeville stage.

Profiting by their own mistakes in Algeria and Tunisia, the French in Morocco have made a steady advance in pacification, unification, and progress. Abreast with the troops, in greater part native, but officered by Frenchmen, have marched the roads, railroads, schools, hospitals, and agricultural bureaus.

Young Moorish aristocrats are being educated, on Mohammedan lines, to serve as future military officers and municipal executives. Young Moorish women of

IN THE POTTERY BAZAAR: TANGIER

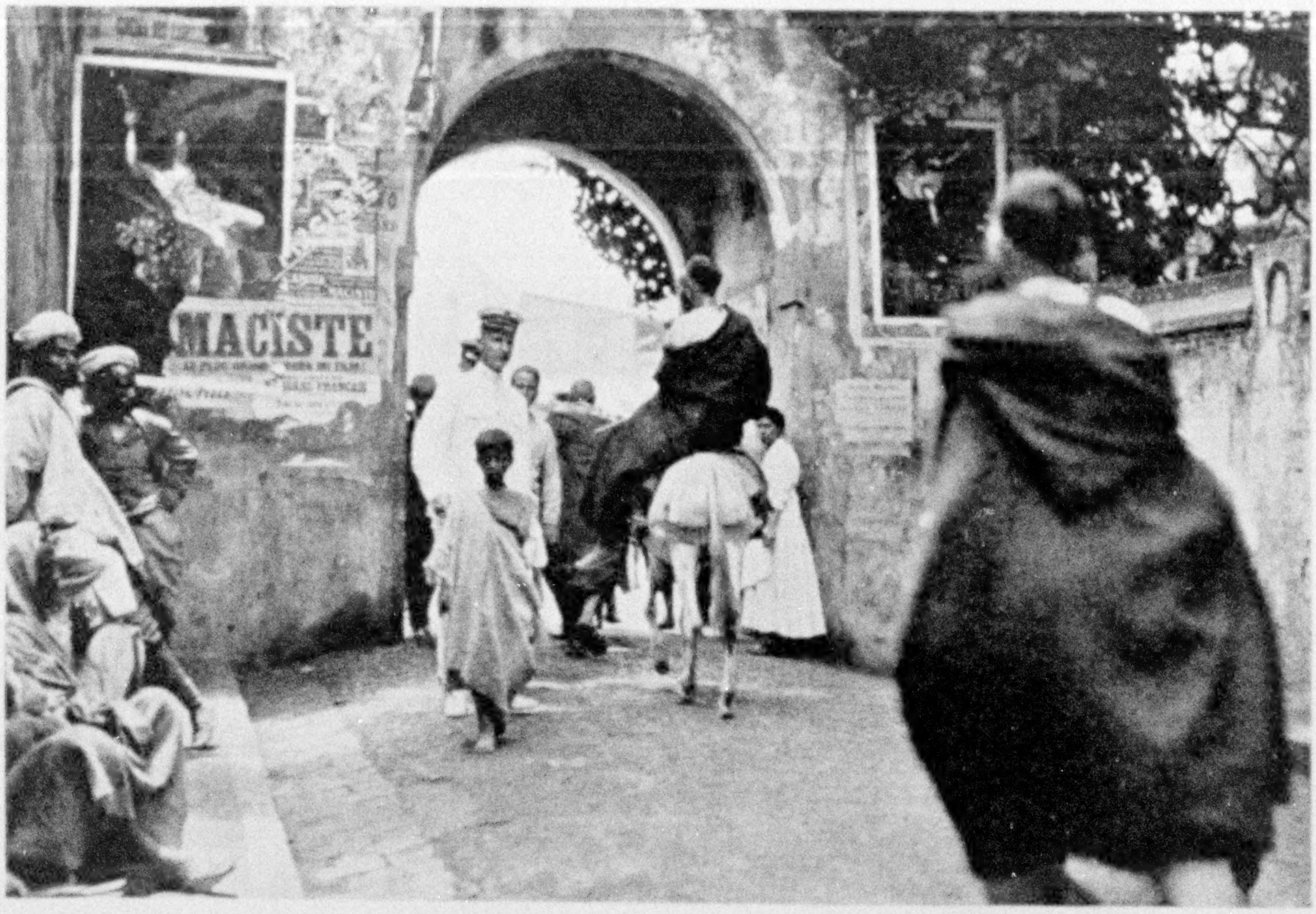
There is a great square or market place in this city where the country people gather, arriving on foot or on donkeys. With their laden camels and donkeys, they bring all sorts of produce and wares, and each article has a special place or corner in the market.

Photographs by H. F. Wight

THE GRAPE MARKET OF TANGIER

This fruit comes from Cádiz Province, Spain. There is a daily round-trip service between Tangier and Algeciras, leaving Spain in the morning and returning at night.

XUM



Photograph by H. F. Wight

ENTERING ONE OF THE GATES IN THE OLD WALLS OF TANGIER

In Tangier one sees a far more cosmopolitan crowd on the streets than in any other Moroccan city, and many more tourists, as so many Mediterranean-cruise ships touch here, and it is only a few hours from Gibraltar by one line and from Algeciras, Spain, by another.

the leading families are being trained. There are schools for French and native children in all the towns, and the long-established Hebrew schools continue.

"It isn't in the fine, large hospitals, where there are separate wards for Christians, Moslems, and Jews, that the best work is being done," the wife of a French officer in Fez told me. "There is a hospital here just for poor Mussulmans, reached through a gate in the outer wall.

"The surgeon is the only 'infidel' in it. His helpers are natives. The most fanatical of the people, who will not let us enter their homes or help them in any way, carry their sick to this hospital. To them the doctor is almost divine."

In this grain-producing country, only 500,000 of the 5,500,000 inhabitants live in the cities. The Berbers are born farmers.

Sugar cane and rice will grow in this land of the olive and the vine, the orange and the fig, and cotton has already been planted along the shores of the Sebu River.

The French claim that certain sheltered valleys of southwestern Morocco are as well suited as the Canary Islands for the growing of bananas, and there are potential forest areas and minerals unexploited. Already a rich phosphate deposit back of Casablanca is being worked.

A MOTOR JOURNEY FROM CASABLANCA TO TANGIER

It is a long day's motor journey from Casablanca to Tangier. The Tangier-Fez Railway should be in operation before many years. A year ago the roadbed was graded nearly all the way from the Fez-Rabat line north to the Spanish border. The highway, which crosses first a low plain and then a hilly country before again skirting the sea, parallels this future railroad.

We passed through Kenitra, a new French town at the mouth of the Sebu River.

At Souk-el-Arba we saw a country market in progress. "Souk" is "Market" and "Arba" is "Wednesday." All country

Wide World Photograph

TYPES OF RIFFIAN WARRIORS WHO HAVE BEEN THORNS IN THE SIDE OF SPAIN-IN-MOROCCO FOR YEARS

These tribesmen, numbering about 30,000, led by the chieftain Abd-el-Krim, occupy the hill territory of the Spanish Zone, a region about 200 miles long and 60 miles deep, overlooking the Mediterranean Sea. They are of Berber stock, allied to other indigenous mountain tribes of North Africa.

markets in Morocco bear the name of the day on which they are held. The people come from long distances with their produce. There is, I believe, no Saturday market because the Jews, who are the chief traders, will not attend.

Arbawa (Arbaoua) was our last French village. Here customs officials examined our luggage. Again we were straying from the tourist circuit. Our companions were French Colonials and Tangier Moors, who could be questioned about the country we were crossing.

The officials at the Spanish frontier were trim and businesslike. We had been warned that we should run right into the Spanish-Moroccan war zone and be shot by the Riffians, but we saw only Spanish soldiers repairing roads and working on the walls of forts.

Many military convoys passed us bound from Larache to the outposts, nearer the Riff Range. We saw, in fact, the beginning of the work of pulling in jagged outer lines and the strengthening of forts on a new Spanish front.

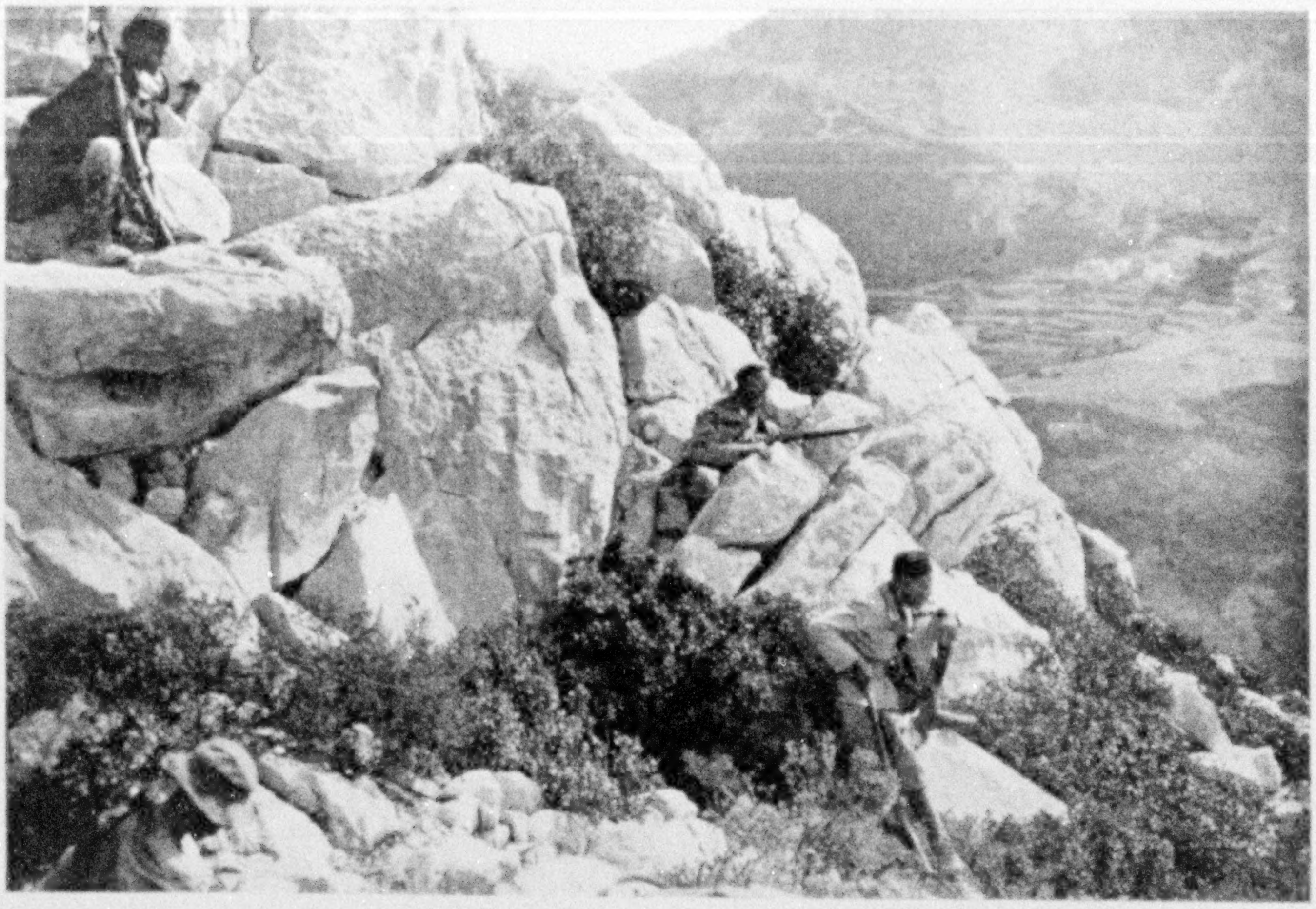
Alcazar (El Ksar-el-Kébir) was our first Spanish-Moroccan town. It is a historic spot. From here expeditions set out for the conquest of Spain. Here, in 1578, Dom Sebastian and the flower of Portugal fell in a mighty battle with the Moslems, a black day for the gallant little land of Prince Henry the Navigator.

Now we headed for the sea, for Larache and Arzila, the two old Portuguese *presidios* on the Atlantic shore of the Spanish Zone. At Larache we crossed the wide Loukkos River on a pontoon bridge, and beyond Arzila came to a stretch of salt marsh where the highway serves as a bridge.

"There's Cape Spartel!" the man next to me cried.

We were rounding the northwest corner of Africa. We were in the International Zone. Ahead lay Tangier.

This city, so well known to travelers,



Wide World Photograph

SHARPSHOOTERS IN THE RIFFIAN HILLS

Recently the Spanish military directorate inaugurated a new policy of withdrawal of Spanish troops from the interior to a fortified coastal belt. The Riffian tribesmen are valiant fighters, but the smallness of their numbers and the fact that they are like an island in the ocean, now completely surrounded by a pacified zone, either French or Spanish, seem to point to their ultimate subjugation, the fate that has overtaken equally brave aboriginal tribes blocking Civilization's path throughout the world.

has great possibilities and may some day be made as attractive as Algiers. The long-discussed and much-needed port works will soon be under way. Tangier has motor-bus service with Arzila and Larache and with the inland town of Tetuán, the Spanish administrative base. A railway connects Tetuán with Ceuta, just across from Gibraltar (see page 298). Ceuta and Melilla are Spain's sister fortresses on the Mediterranean under the shadow of the Riffian hills.

In the United States there is much misinformation current regarding Spanish Morocco, the general impression being that every Moor is about to cut the throat of every Spaniard. The truth is that a fair percentage of the 500,000 native inhabitants speak Spanish and, through centuries of association, are on friendly terms with their conquerors. There are many Spaniards living among the Moors and loyal Moorish soldiers fighting with the Spaniards against the Riffians.

The Riffian clansmen, with whom Spain is having such great difficulty, are Berbers, allied in blood and independence of spirit with other hill tribes of North Africa. They occupy a semicircular mountainous district back from the coast, extending from southeast of Tetuán to east of Melilla. Some of the peaks of this region are nearly 6,000 feet in height.

In their mountain fastnesses, with their herds and flocks, upland forests and little vales between the hills, where grain can be grown, they are self-supporting.

The coastal fields of Spanish Morocco are peacefully cultivated. Seeds and agricultural implements are being distributed among native farmers, roads are being built, schools are being opened.

In safety and comparative comfort we journeyed across Old Morocco, seeing, as through the veil of centuries, country life as it was three thousand years ago, cities which are perfect settings for Arabian Nights' tales, oases where clustering date palms whisper the secrets of that vast Sahara which lies beyond.

THE SINGING TOWERS OF HOLLAND AND BELGIUM

By William Gorham Rice

THE story I shall tell here is one of exploration, not in distant lands, but in the near-by and well-known Low Countries. It is a tale, too, of discovery for most Americans, at least, of a new kind of music.

That this rather unusual subject may be the more readily understood, it is worth while at the beginning to give a few moments' thought to the lands where this unique music originated, and to consider why it is now attracting special interest.

Four hundred years ago Charles V, Roman Emperor and (as Charles I) King of Spain, inherited the territory now within the boundaries of Holland and Belgium.

To duchies, counties, bishoprics, and lordships existing there, he added French Flanders, and proclaimed a new political unit under the name of the Seventeen United Provinces. Appropriately, the seal of the new federation was a lion holding a sheaf of seventeen arrows.

But soon the sheaf fell apart and the arrows were turned against one another in long and devastating war.

Yet within this distracted territory, and in a time of sieges and of distress unparalleled, a civic music of rare beauty came into being—a music which, while continuing ever since and increasingly holding a place in the love of its people, has been until lately almost unknown outside the boundaries of its origin.

Gradually since the time when Charles V reigned, this music has been wonderfully developed. To-day it is widely commanding artistic consideration and, with its noble architectural setting, it is coming to be recognized as peculiarly fitted to adorn and stimulate civic and community life everywhere.

A LAND DOTTED WITH SPIRES

The region of which this article treats extends from the North Sea shores inward for 50 miles or more in plains which are largely just above high tide. Often, with protecting dikes, portions of fertile acreage there are found even below sea level. Throughout these tranquil reaches windmills and waterways abound, and sometimes ships seem to be sailing through the land.

On every side one sees scores of cities, towns, and villages. In the foreground these are clearly defined, but in the middle distance they become less distinct, and on the horizon in soft and misty outline they almost disappear.

In every such extended view, above town hall and city gate and ancient church, rises dominant here a rugged tower, there a tall belfry or a graceful, slender spire. And each of these skyward-soaring structures becomes for the traveler a Singing Tower if, on nearer approach, he finds it crowned with that majestic instrument of music called a carillon.

The word "carillon"—pronounced "car' i-lon," with the "o" as in "atom"—and the derivative, "carillonneur," are French in origin, but now generally accepted in English.

THE CARILLON EXPRESSES THE SPIRIT OF A COUNTRY

After crossing the Atlantic, we touched at Plymouth and at Boulogne, and then on a Friday night came in sight of the shores of the Netherlands. At the mouth of the River Maas (Meuse) we waited for the high tide at two in the morning, to make it possible for our great ship to steam slowly up to Rotterdam.

Here we found the tower of St. Lawrence's Church, whose old bells make not merely a great musical instrument, but by their melodies express the spirit of the country over which they sound.

De Amicis, the Italian traveler, after climbing the tower of St. Lawrence, said that the indefinable sentiments inspired by the Dutch landscape held him silent for a long time. Then he was startled by strange music coming from he knew not where—the silvery notes now falling slowly one by one, now coming in groups,

XUM

Photograph from William Gorham Rice

THE SINGING TOWER OF THE NEW CITY HALL AT ROTTERDAM

Its carillon of 47 bells, the largest and finest installed in the last 100 years, is the gift of Phs. van Ommeren, Jr., shipping merchant of Rotterdam and New York, and commemorates a family name long identified with Dutch commerce. Rotterdam boasts two other carillons—that of St. Lawrence's Church (see opposite page) and that in the tower rising above the Bourse.

in trills, in sonorous chords, a quaint dancing strain somewhat primitive, an echo of the ancient life of her people, making one smile and sigh at the same moment.

We mounted the circular stone stairway leading to the heights of tower after tower to see the bells of a carillon in all their beauty of decoration and arrangement.

We found ourselves among a great company of bells, fixed upon a heavy framework and extending in parallel rows, tier above tier, completely filling the great tower room.

The little bells hang in the highest tier; the big bells just clear the floor; the intermediate sizes hang in tiers between. The largest bell of all is taller than a tall man and it may weigh four, five, or even six or eight tons. The smallest bell has a height of 10 or 12 inches only and perhaps a weight of less than 20 pounds.

Photograph from William Gorham Rice

THE SINGING TOWER OF ST. LAWRENCE'S CHURCH, ROTTERDAM

In this tower is a carillon of 39 bells, most of which were made in 1660 by Frans Hemony.

Soon our search showed us that of greater consequence, however, than number, or size, or weight, is the pitch relationship of the bells; for the bells of a carillon always progress by regular semitone or chromatic intervals. The carillon of St. Lawrence's tower has these intervals complete through more than three octaves, except that the two lowest semitones are lacking.

CARILLONS ARE PLAYED BY TOWER CLOCKS AND BY HAND

The arrangement and character of the bells had first attracted our attention. Then we began to study how the music is produced. We soon discovered that a carillon is played in two ways:

First, automatically by a revolving barrel connected with a tower clock, which starts the music at the hour, the half hour, and at the quarters, and sometimes even at the eighths (see page 364).

Second, by a trained musician, a carillonneur, seated at a keyboard like that of an organ. Six and even more notes can be struck in chords on the carillon keyboard, and, so delicate are the adjustments, that sustaining tones on the lighter bells are easily accomplished by "tremolando" (see page 367).

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THE ONCE FLOURISHING PORT OF VEERE: THE NETHERLANDS

The town is full of architectural relics of its palmy days of the 16th century, when it was the chief continental trading port of the Scottish woolen factories. Its ancient houses and historic town hall, with its graceful singing tower, form a real picture. Its carillon has 34 bells, chiefly from the foundry of Pieter and Andreas van den Gheyn, of Amsterdam.

Automatic playing of simple folk songs, chiefly on the light bells, with now and then the addition of a deep bass tone, is what the traveler constantly hears as he wanders through old towns in Belgium and Holland. The keyboard-playing by a carillonneur is reserved for special occasions only. It takes place on the market day, and on Sunday, and in the greater cities on a fixed evening every week in summer, particularly in Belgium. Then for one hour an elaborate concert, often with a printed program, is given. Then, too, the best music of great composers, such as Beethoven and Schubert, is played, as well as beautifully arranged Flemish and French folk songs and national hymns.

Thousands gather for these concerts. Quiet, even in so large a city as Antwerp, is then maintained in the neighborhood of the tower, vehicle traffic being diverted

Photograph from William Gorham Rice

LEIDEN TOWN HALL, WITH THE CARILLON TOWER IN THE BACKGROUND

After mounting the fine perron leading to the main entrance and reaching the burgomaster's room, which is adorned with magnificent old tapestries, it is a short climb up an electrically lighted stairway to the carillonneur's room. The ceiling of his room has mortised beams radiating from the center and has white stars painted on a blue ground in the spaces between.

from the near-by streets by order of the burgomaster.

ROTTERDAM HAS VARIETY OF CARILLON STRUCTURES

The tower of St. Lawrence's Church was begun in 1449, and the city placed a carillon in it in 1660. In the tower of the Rotterdam Bourse we found a smaller carillon of 27 bells, also more than two and a half centuries old.

A third carillon in Rotterdam to which we listened is the one that has just been placed in the new City Hall. It is larger, both in weight and in number of bells, than any carillon made in the last 100 years (see illustration, page 358).

Rotterdam's three Singing Towers, rising one above the City Hall, one above the Bourse, and one above the Church of St. Lawrence, gave us a clue to the variety of structures which may possess

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A HESITATING PURCHASER: ARNEMUIDEN FISHWIVES IN THE MARKET OF MIDDELBURG

a carillon. Our journeys showed us that similar music had floated for more than two centuries over the city gate at Enkhuizen, the Royal Palace at Amsterdam, the Weigh House at Alkmaar, the Cloth Hall at Ypres (destroyed during the World War), the University Library at Ghent, the Wine House at Zutphen (burned in 1921), and the Abbey at Middelburg, and that the spires of not a few of the historic churches of the Low Countries are Singing Towers.

Finally, we discovered the important fact that wherever a carillon hangs, its bells are owned by the city, its carillonneur is an official chosen by city authority, and the tower itself is under city control.

What a ride of peaceful beauty it is from Rotterdam to The Hague! Windmills and waterways, long rows of slender trees, and black-and-white cattle contentedly grazing, are to be seen on every side. We went by automobile in order to enjoy with fresh appreciation our first 14 miles in Holland.

At Delft the carillon is in the spire of the New Church, called "new," though over 400 years old, because it was begun

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ZEELAND VILLAGERS AT A CHURCH SERVICE

The costume and headdress of the women of this district are among the most elaborate in Holland.

a century later than the Old Church, near by. Here, far above us, we could see nearly four octaves of bells, ranged in rows above and on both sides of the dial of the tower clock.

Within the New Church, not far from the tombs of William the Silent and of Grotius, we found the final resting place of Delft's most famous carillonneur. On it is this inscription:

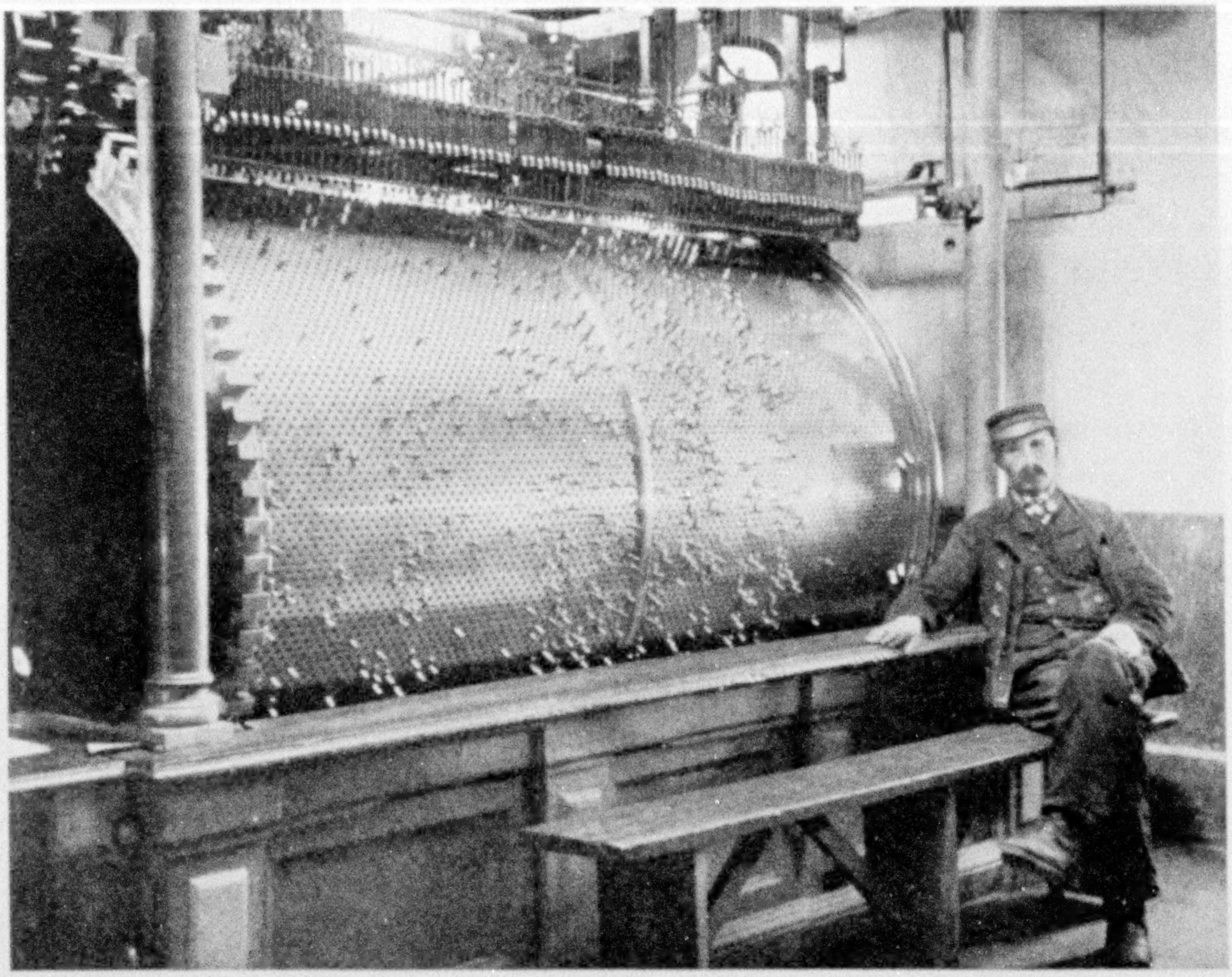
> Here lies Dirck Scholl, who for more than sixty years made the carillon in the New Church to live.

Six miles beyond historic Delft lies The Hague—old, yet cosmopolitan, and ever delightful. We walked across the Square to the near-by Vyver, that small sheet of water in the center of the city, surrounded by shaded walks and the restful Parliament buildings.

As we sat under the trees looking down on the fascinating reflections, we heard coming faintly from the Singing Tower in the background an enchanting folk song. Then slowly a deep bass bell gave the afternoon hour.

HOW THE CARILLON ORIGINATED

In Holland and Belgium, about the middle of the 15th century, when timepieces were rare, and the people were much more dependent upon the town clock for knowledge of the time of day



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THE CHIME MECHANISM IN THE LOFTY TOWER OF "LONG JOHN" OF MIDDELBURG

The large metal drum rotates once every hour. The teeth on the drum, set at proper intervals and striking the keys, which are connected by wires with the 40 bells of the tower, play various popular airs. From time to time the pins are changed, as different tunes are desired. The mechanism bears the date 1715.

or night, it became the custom, as a premonitory signal, to precede the striking of the hour by a short automatic chiming on three or four small bells hung in the clock tower.

As this town and that sought to surpass its neighbors the bells were increased in number and the musical scale of tones and halftones thus became complete. Brief melodies began to be heard at the hour and the half hour, and with the addition of still more bells came, at these divisions, whole tunes played upon three or even four octaves of bells. All this playing was automatic.

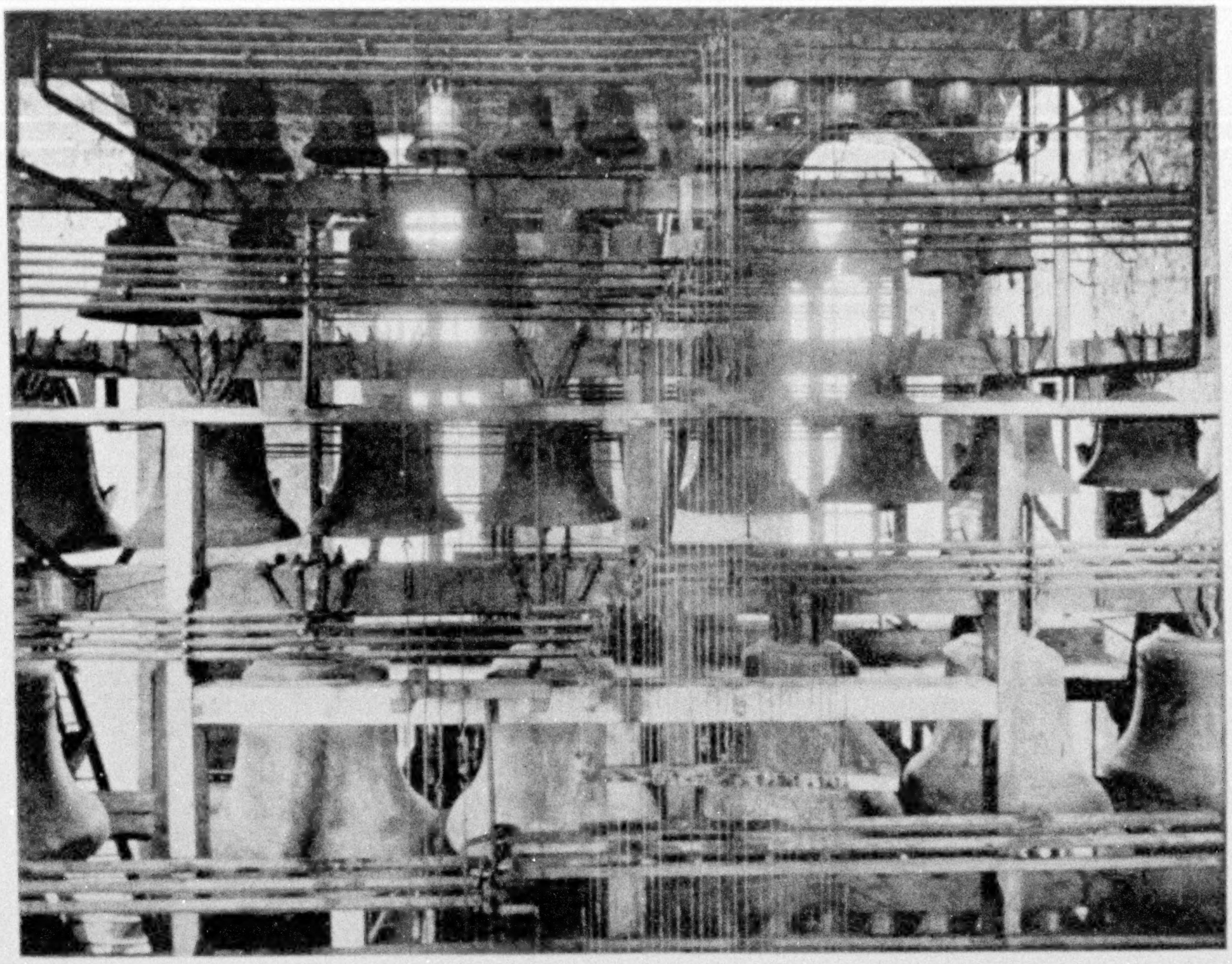
Then came the adoption of the keyboard, similar to that of the organ, with each key representing a bell note and readily responding to the art of the accomplished musician. Soon pedals were devised to play the heavier bells.

Thus, in the course of two or three centuries, was developed the carillon.

By making The Hague a center we found we could easily reach every part of Holland's carillon region in day journeys. Early one morning we went to Gouda. There, in the great church, we gazed upon the wonderful 16th century glass windows, the finest in Holland, abounding in glorious color, allegorical design, and historic interest, and listened as the carillon played far above us.

A CARILLONNEUR MUST BE FREE FROM GOUT

Ascending the steep winding staircase, we came finally to the carillonneur's cabin. There a charming scene met our eyes. Seated at the keyboard was the carillonneur, surrounded by an admiring group of seven boys and girls, who were thus



Photograph from William Gorham Rice

THE BELL CHAMBER AT GHENT, BELGIUM

The massive masonry and the tall windows of the Singing Tower are seen, and rising tier above tier are many of the bells of the carillon, the smallest at the top weighing only about 18 pounds. The wires and rods connecting both the keyboard and the barrel (see page 364) with the bells show clearly. Here one feels he stands in the center of the most gigantic of musical instruments. Of the 52 bells at Ghent, 33 of the medium-sized and smallest are visible in the picture. Fine craftsmanship is displayed in the ornamentation of these ancient bells, which, hidden as they are in the high recesses of this Singing Tower, few eyes ever have opportunity to look upon.

enjoying the morning of their Saturday holiday. One boy played now and then in duet with the carillonneur, and later, in our honor, they played together, "My Country, 'Tis of Thee."

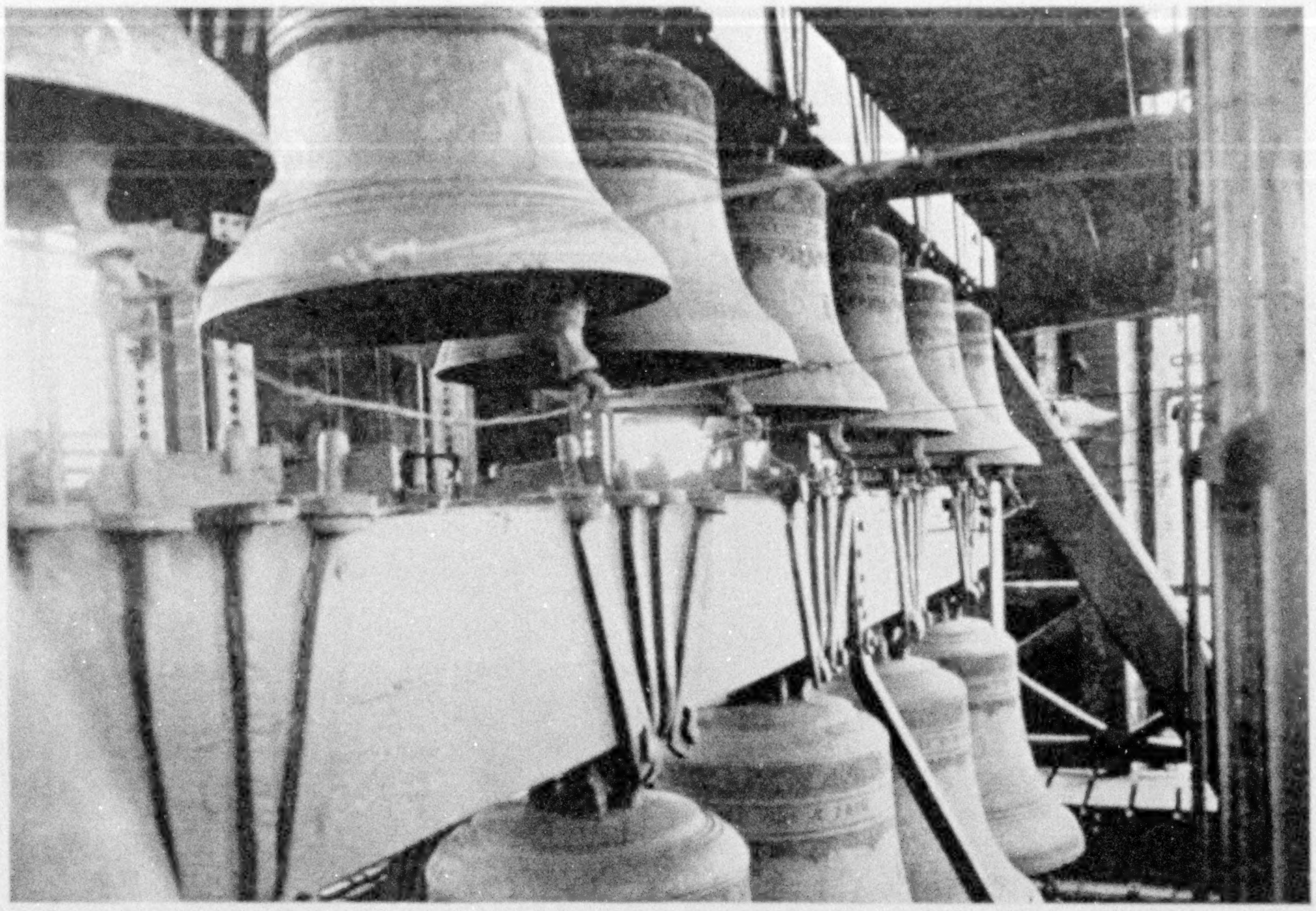
Painted on two of the great posts of the frame that carries the bells, we read the names and date of service of all Gouda's carillonneurs, from 1669 onward, covering two and a half centuries. The longest recorded term was 63 years, the shortest 10, and in all only seven names appeared. The present incumbent has already 16 years to his credit. He is one of the best carillonneurs in Holland and is deeply devoted to every phase of his art. Carillon playing everywhere in the Low Countries is a question not so much of pay as of pride.

Fischer, author-carillonneur, who played in 1738 in Utrecht, declared that a carillonneur must have a good knowledge of music, good hands and good feet, and no gout!

THE PILGRIMS HEARD LEIDEN'S CARILLON

Only half an hour from The Hague is Leiden, where we found the Singing Tower crowning the low and very beautiful Town Hall. The Pilgrims, who, after leaving England, lived for a time at Leiden, undoubtedly heard this music, for the city has had a carillon since 1578.

Twenty-five miles beyond Leiden we came to Haarlem. There the carillon is in the tower of the old church, famous for its organ and models of historic ships suspended high in the groined arches of



Photograph from William Gorham Rice

BELLS AND TONGUES IN KEYBOARD RECITAL AND CONCERT PLAYING

Tier above tier of bells in rows is seen in the carillon chamber. The tongues of the bells as used in keyboard play clearly show here. These tongues are held near to, but not touching, the inner sound bow of the bells, and are made to strike by a carillonneur seated at a keyboard like that of an organ. This keyboard has all the notes, like the black and white of the organ keyboard, through several octaves. The carillonneur in playing uses both hands and feet. He obtains a sustained note by tremolando; for, as the tongue of the bell is kept by springs close to the sound bow, a quick touch upon the delicately adjusted key of the keyboard sounds the bell successively, as often as may be desired.

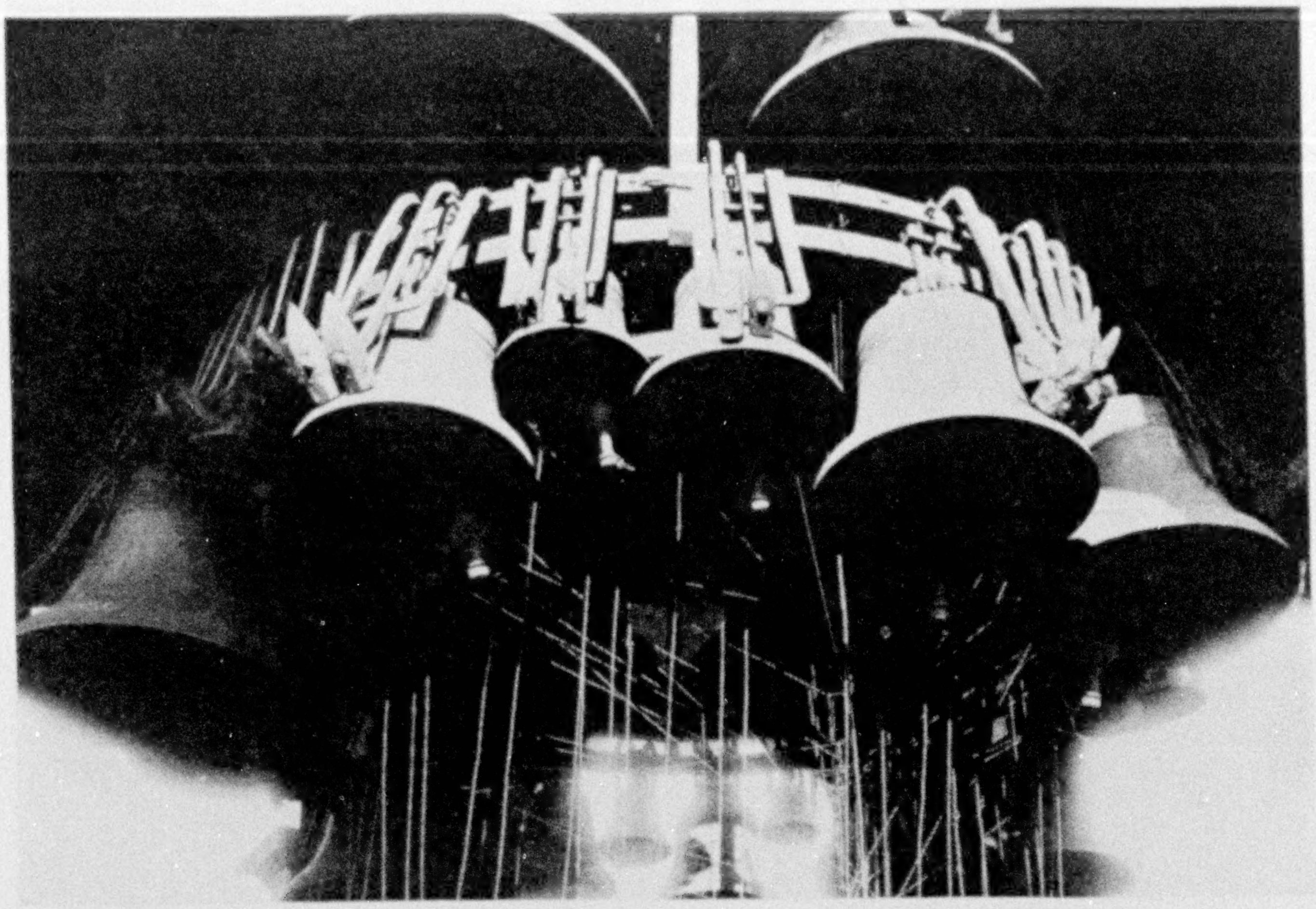
the ceiling. As we stood in a quiet street listening to the bells, a baker's boy passed us with a tray of cakes balanced on his head. He looked up affectionately at the tower, paused long enough to catch the air the carillonneur was playing, then joyously whistling it, he went the happier on his way.

AMSTERDAM HAS SIX SINGING TOWERS

Amsterdam, the commercial capital of Holland, lies 38 miles from The Hague. Whether the journey between these cities is made by railway, by canal, by automobile, by bicycle, or on foot, it is a succession of attractive scenes. To us it was a continuation of the beauty that we had already enjoyed between Rotterdam and The Hague, with the addition of tulip and hyacinth and gladiolus fields and in the distance, the dunes.

Amsterdam is first among present-day cities in the number of Singing Towers it possesses. The Royal Palace, the old Mint Tower, the Ryks Museum, and the Zuider, the West, and the Old Church spires all have carillons.

When we came to know that Amsterdam had six carillons we were not surprised that John V of Portugal, traveling in the Netherlands in 1730, was so impressed with this music that he determined to have a carillon for his sumptuous palace then being built. The price having been ascertained, it was guardedly suggested by his treasurer that the cost was rather great. This implied criticism so offended the self-esteem of the monarch that he replied, "I did not think it would be so cheap; I wish two." And these he got, for two magnificent carillons, played by keyboard and clockwork, exist to-day in the royal residence at Mafra, near Lisbon.



Photograph by D. J. Van der Vens

THE "GRAPE-CLUSTER" ARRANGEMENT OF HEMONY BELLS IN THE CUPOLA OF THE AMSTERDAM ROYAL PALACE

© Maison Ed. Nels

A CARILLON LESSON GIVEN BY JOSEF DENYN, GREATEST LIVING CARILLONNEUR

At the left (seated) is Nees, at the right Lefevre, two of his most promising pupils. The School of Carillon Instruction, free to the world, was inaugurated in August, 1922, at Malines (Mechlin), Belgium (see text page 376).

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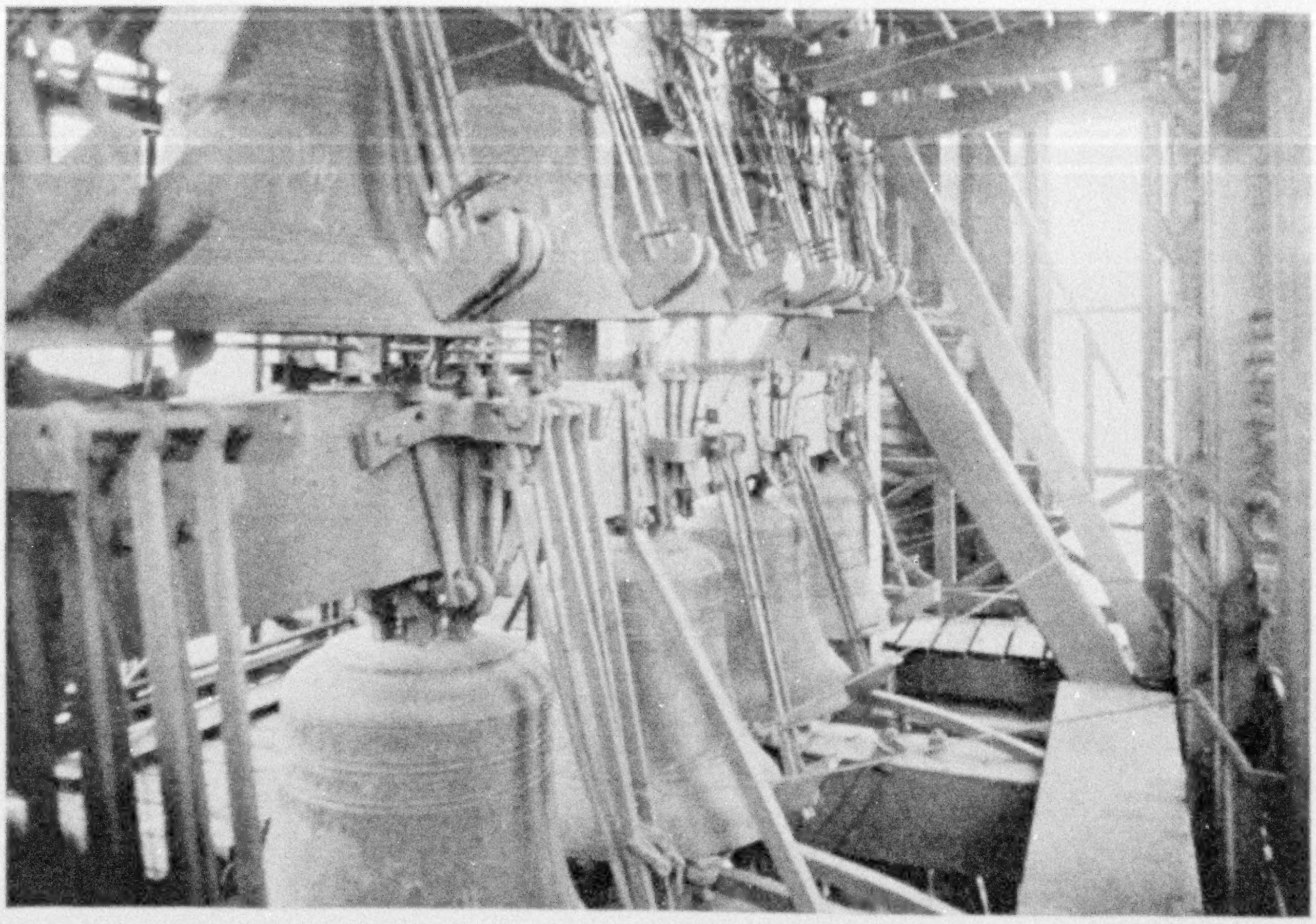


Photograph from William Gorham Rice

BELLS AND HAMMERS IN AUTOMATIC PLAY: ANTWERP

From two to five or six hammers are used on each bell for the automatic play. These hammers are connected with the great barrel, which is stopped and started by the clock mechanism (see page 364). More than one hammer is used, so that a quick repetition of a note may occur where needed in the melody. The hammers are connected by wires and rods with the levers, which are tripped by the arranged pins on the barrel. There are springs behind each hammer, which hold it when at rest a quarter to a half inch from the outside sound bow of the bell. This secures a clear staccato stroke each time the hammer falls. The tongues, which are used in keyboard play, also are seen about opposite the hammers (see also illustration, page 366).

Only copper and block tin, in the proportion of three parts of copper to one of tin, were used in making ancient bells, and the same practice prevails among the best bell founders to-day. From which it may well be concluded that the "golden molten" bells of Poe, the "heart-of-iron" bells of Longfellow, and the "silvery" bells of other writers are solely poetic license.

1,500 TUNING FORKS BRING BELLS INTO ACCURATE TUNE

In one foreign bell foundry the equipment consists in part of 1,500 tuning forks. There bells are brought into as accurate tune as is a piano. Properly made bells, once in tune, remain so always.

It is half a day's journey from The Hague to that part of the Singing Tower region far in the northeast of the Netherlands, where purple heather and hills abound.

Groningen, not far from the seacoast, in these higher lands, merits a visit. Here, high up in the tower of St. Martin's Church, we saw one of the finest of carillons.

When we were there a city watchman, as had been the custom for centuries past, spent the night in this tower. Immediately following the ripple of the bells every quarter of an hour, he appeared successively on each of the lofty miniature balconies that face each point of the compass. After all was serene in the sleeping town below, he sent out to north, south, east, and west a faint trumpet strain. And what more restful reminder that "All is well" can be conceived; or what more frugal scheme to let the tax-

Photograph by Emil P. Albrecht

NOTRE DAME CATHEDRAL, ANTWERP, FROM THE SOUTH PROMENADE, THE LARGEST AND MOST BEAUTIFUL GOTHIC CHURCH IN BELGIUM

The church was begun in the 14th century and finished in 1518. The spire is very elaborate. It contains a carillon or 47 bells.

paying burgher know that at least one employé is awake and on his job!

Alas! this ancient custom has now ceased, and the last survivor of the trumpeting tower watchmen, a company that even in recent years has given a medieval touch to many a city of the Low Countries, through the operation of municipal economy, has been retired.

Other explorations took us to Amersfoort, Arnhem, Utrecht, Middelburg, Flushing, Veere and Zierikzee, in each of which towns we found carillons which commanded our interest and invited our study.

And then our journey took us into Belgium.

ONE SCENE OF "LOHENGRIN" IS LAID ON ANTWERP'S RIVER BANKS

Looking out over the trees of the Place Verte, at Antwerp, from the open windows of our hotel we saw the Cathedral spire close enough to us to reveal the

© Donald McLeish

THE MINT TOWER OF AMSTERDAM

This is one of the six Singing Towers of Holland's commercial capital. Its small carillon plays automatically, giving popular airs every quarter hour. The bells are in the open arches above the clock. Amsterdam shows full justification for the name, "The Venice of the North."

delicate details of its beauty, and, above the confusion of the flower market and tramcars in the busy square below, we heard, before the great bell Karolus struck the hour, a lightly falling carillon melody.

Full of poetic associations are the near-by river banks, for it is "On the Scheldt, near Antwerp," that one scene of "Lohengrin" is laid. And majestic are the sweep of space and time and the silence of night, with this music dominating all, that Rosetti has conceived in his poem, "Antwerp and Bruges."

At Ghent, where the bells hang in a separate structure, the Belfry, an intelligent custodian took us up the tower in a modern electric lift. Nowhere else is a carillon tower so equipped, and to those who would gain the height and see for themselves, near at hand, the bells of a carillon of the first order, and its mechanism and the carilloneur's cabin, and yet would avoid an arduous climb, Ghent is commended (see page 373).

The carillon of Ghent rang out more than a century ago when, on December 24, 1814, the Treaty of Peace between Great Britain and the United States was concluded.

Photograph by William Gorham Rice, Jr.

ST. ROMBOLD'S SINGING TOWER, MALINES (MECHLIN), BELGIUM

This is the most important Singing Tower in carillon art (318 feet high) and many think it the most imposing in the world. On its 45 bells Josef Denyn gives his wonderful concerts Monday evenings in summer, when thousands come to listen. St. Rombold's is the Cathedral of Cardinal Mercier.

LONGFELLOW WAS INSPIRED BY BELGIUM'S SINGING TOWERS

Eighty years before Bruges came into our field of exploration, Longfellow, dwelling in Belgium in his student days, had felt the appeal of the Singing Towers. The entries in his diary of 1842, and his poem "The Belfry of Bruges," of which one part is called "Carillon," show the impressions then made upon him.

In the World War the carillonneur of Bruges was of age to serve in the army and, his wife and child having been sent to England, he was compelled, so he told us, to leave the carillon to its fate. When the war was drawing to a close, he found himself near Bruges and asked permission to go and see how his home had

Photograph by Alexander Stewart

BRUGES, SEEN FROM ONE OF ITS MANY CANALS

The 13th century was the epoch of Bruges' greatest prosperity. It was the center of the trade of the Hanseatic League and the chief commercial city of Europe. Everywhere in Bruges the Singing Tower—the Belfry—dominates the scene. It was "in this quaint old Flemish city" that the poet Longfellow, traveling in 1842, came under the spell of its carillon, and as a result wrote the poem, "The Belfry of Bruges," of which one part is entitled "Carillon." In his diary of that May visit he speaks of his evening arrival in Bruges and his rising long before sunrise the next morning to climb the tower; and he describes the great carillon; the singing of the swallows with the bells; the view, as the darkness fled, and the landscape in the fresh morning air, with the canals linking the city to the sea.

Photograph by Edgar K. Frank

A CANAL IN AMSTERDAM, WITH ZUIDER KERK IN THE DISTANCE

This tower contains 35 bells, 32 of which were cast by the Hemonys in 1656. A chime may be described as a section of a few bells out of the central part of a carillon. Bells in a chime may be arranged to swing; bells in a carillon are hung "fixed." English change ringing uses a swinging chime, and every bell for such ringing has its own rope and ringer.

Photograph by Emil P. Albrecht

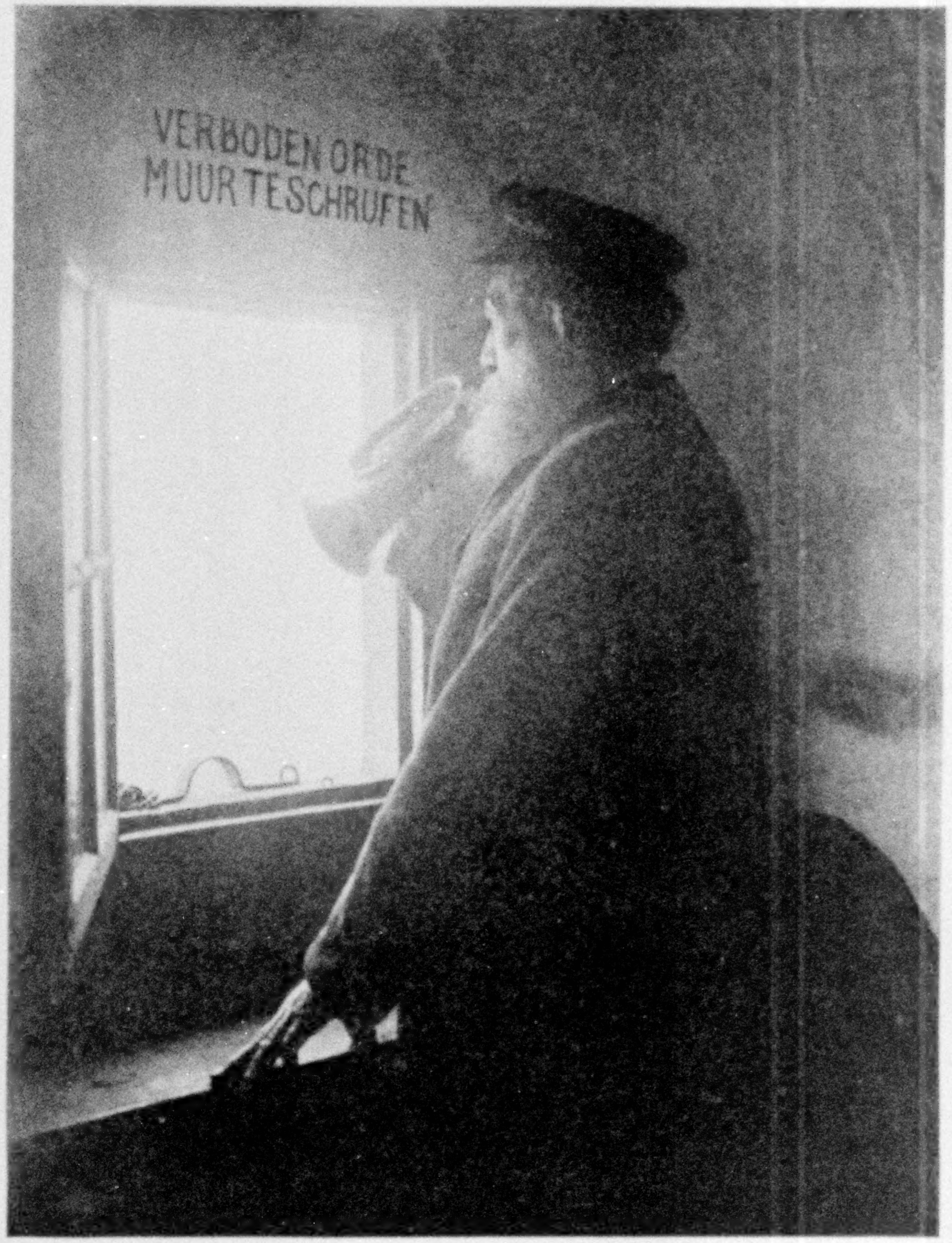
AT THE LEFT IS THE MASSIVE BASE OF THE BELFRY AT GHENT

Just beyond is the Cloth Hall, and in the middle distance is the Cathedral of St. Bavon. In this belfry is a carillon of 52 bells. Among them is the famous "Roland," cast in 1314, recast in 1659, and now again to be recast, as it cracked just before the World War began, in 1914. On it, in Flemish, is inscribed: "My name is Roland. When I toll there is fire; when I peal there is victory in the land."

Photograph by D. J. Van der Vens

THE BELL MAKERS (AFTER AN OLD PRINT)

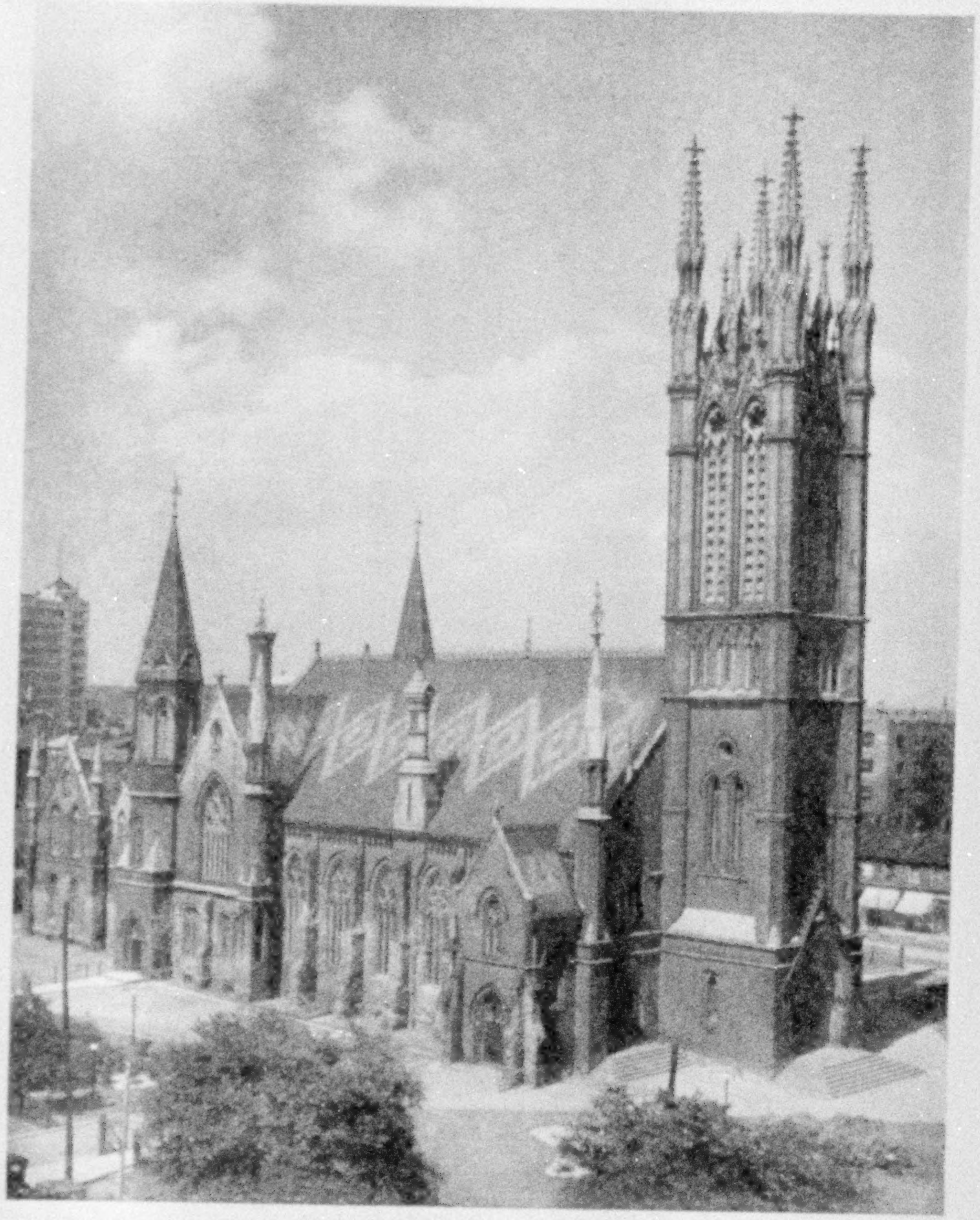
The two brothers, Pieter and Frans Hemony, the world-renowned 17th-century bell founders, are commonly accepted to have been the inventors of the modern carillon. It was in 1654 that Frans, a well-known carillon and cannon maker, came from quiet Zutphen to live at lively Amsterdam, where the city fathers gave him a foundry site. Other names famous in the history of bell making are Waghevens, van den Gheyn, and Dumery.



Photograph from William Gorham Rice

THE LAST SINGING TOWER TRUMPETER: GRONINGEN

Through centuries every quarter of each hour of the night, in tower after tower, in the Low Countries, a trumpeter watchman, if he saw all was well in the sleeping town below, followed with a faint strain of trumpet music the light automatic play of the carillon. At Groningen this custom continued even until the explorations here recounted by the author (see text, pages 368-369).



Photographs from William Gorham Rice

SINGING TOWER OF THE METROPOLITAN METHODIST CHURCH, TORONTO, CANADA

Toronto has the distinction of having installed the first bells entitled to be called a carillon in America. There the Metropolitan Methodist Church has 23 bells, mellow in tone and giving two chromatic octaves complete, except the two lowest half notes. The tenor, or largest bell, weighs four tons. The entire weight of the bells of this carillon is 17 tons. It was first played on April 2, 1922, the fiftieth anniversary of the church in which it hangs.

THE SINGING TOWER OF THE PORTUGUESE CHURCH AT GLOUCESTER, MASSACHUSETTS

Our Lady of Good Voyage is the poetic name of this church, in the southern tower of which hangs the first accurately tuned carillon in the United States. It has 33 chromatic bells and these give all the tones and half tones for nearly three octaves. The carillon was first rung in recital on July 23, 1922. The largest bell has a diameter of 3 feet 7 inches and weighs 1,900 pounds, while the smallest is 7 inches in diameter and weighs 19 pounds.

fared. Finding all was well there, he ascended the tower and sought out his beloved bells. There he discovered the wires had been cut, but quickly mending them, he was able, when the King and Queen rode into the city a few hours later, to inspire the crowds below with the strains of *La Brabançonne*.

A CONCERT BY THE PADEREWSKI OF THE CARILLON

Most glorious of all the Singing Towers is that which rises above St. Rombold's noble cathedral at Malines (Mechlin). Appropriately it, too, is the cathedral in which the great Cardinal Mercier officiates.

We arranged our journey so as to reach Malines for the anniversary of the 35 years of service of the distinguished carillonneur Josef Denyn. His skill is indeed marvelous. Well may he be called the Paderewski of the carillon.

Having arrived at Malines early on Saturday evening, we found ourselves in the current of a street pageant in Denyn's honor. Ancient guilds with superb banners and modern societies of every kind marched in the procession. Thousands of people filled the old streets. Houses and public buildings everywhere were gaily decorated.

This impressive pageant was but the beginning of events which filled four days, during which came the inauguration of the School of Carillon Instruction, free to all the world; the meeting of the first Carillon Congress ever assembled; the opening of the Exposition of Carillon Art, lasting through September, and the playing of visiting carillonneurs from France, Holland, and Belgium.

On Sunday noon, in the crowded Town Hall, the burgomaster presented to Denyn a gold medal from the city, and there the American Ambassador to Belgium spoke.

Carillon art attains its noblest expression in the evening concerts by Denyn at Malines. These take place year after year, on Monday evenings, in June, August, and September, from 9 to 10 o'clock.

Malines is midway between Antwerp and Brussels and distant only half an hour from each, so that multitudes from both these cities attend the concerts. Of late many have come also from much greater distances in Europe and from all parts of the world. A program of the music to be played at each concert is published months in advance. And while the great master plays all is quiet, even in the Grand' Place.

That Monday evening, after the hour bell of St. Rombold's Cathedral ceased striking and the vibration of its deep and solemn tone had died away, there was silence. So long a silence it seemed, so absolute, that we wondered if it was ever to be broken. Then pianissimo, from the highest, lightest bells, as if not to startle us, and from far, far above the tower—it seemed, indeed, as if very gently shaken from the sky itself—came trills and runs that were angelic. Rapidly they grew in volume and majesty, as they descended the scale, until the entire heavens seemed full of music.

Seated in the garden, we watched the little light in the tower, where we knew the unseen carillonneur sat at his keyboard and drew the music from his keys; and yet, as we watched and listened, we somehow felt that the music came from somewhere far beyond the tower, far higher than that dim light, and was produced by superhuman hands.

Sometimes the sounds were so low that we found ourselves bending forward to hear them. They seemed to come from an infinite distance, so faint and delicate were they. Then, at other times, great chords, in the volume of many organs, burst forth rapturously!

The concert ended at 10 o'clock with the national air of Belgium. Directly after this the great bell slowly struck the hour.

THE WORLD HAS 180 CARILLONS

In the world to-day are 180 carillons. Of these 134 are in Belgium and the Netherlands. The rest are scattered in other parts of Europe, the United States, and Canada.

Eleven carillons were destroyed in the World War, but already three of these have been replaced.

INDEX FOR JULY-DECEMBER, 1924, VOLUME READY

Index for Volume XLVI (July-December, 1924) of the National Geographic Magazine will be mailed to members upon request.

Consommé to grace the finest feast!

Consider the occasion when consomme is most appropriate—the formal dinner when many courses are served—and you will realize how much is expected of it.

Consomme must possess a delicate lightness, an exquisite bouquet, a rare perfection of flavor. Yet it must, at the same time, be deliciously stimulating, a challenge to the appetite, a tempting invitation to the rest of the feast.

More than equal to this exacting role, Campbell's Consomme proves it by the regularity with which it is selected for formal service at dinner or luncheon. Made from only selected beef. Clarified to a beautiful and sparkling amber. Delicately flavored with the essence of young carrots, celery, parsley and a touch of onion.

12 cents a can

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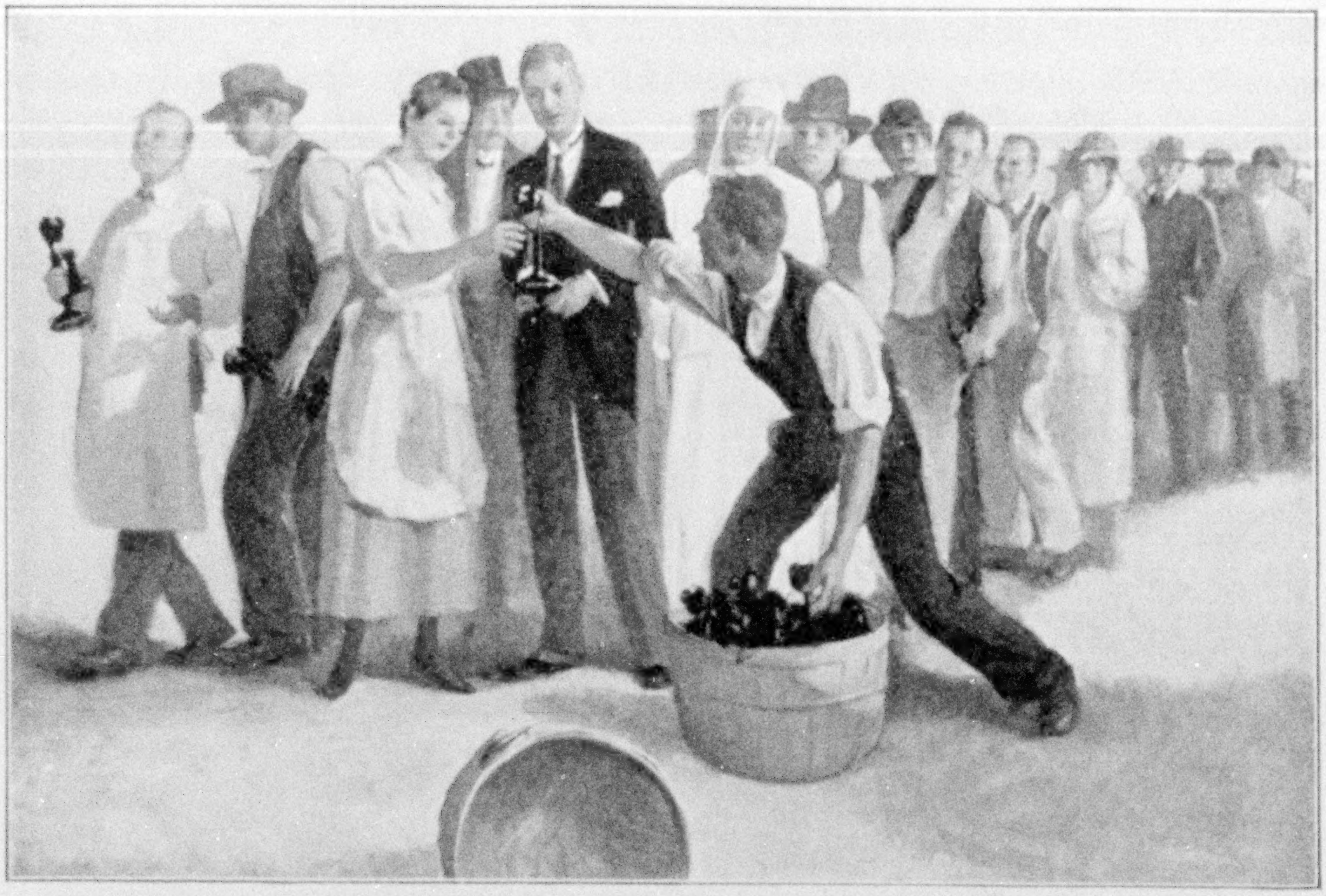
LOOK FOR THE RED-AND-WHITE LABEL



Give us Telephones!

Following the war, when business and social life surged again into normal channels, there came the cry from homes, hospitals, schools, mills, offices—"Give us telephones." No one in the telephone company will ever forget those days.

Doctors, nurses and those who were sick had to be given telephones first. New buildings, delayed by war emergency, had to be constructed, switchboards built and installed, cables made and laid, lines run and telephones attached.

The telephone shortage is never far away. If for a few years the telephone company was unable to build ahead, if it neglected to push into the markets for capital and materials for the future's need, there would be a recurrence of the dearth of telephones. No one could dread that so much as the 350,000 telephone workers.

Bell System engineers measure and forecast the growth of communities; cables, conduits, switchboards and buildings are planned and developed years ahead, that facilities may be provided in advance of telephone want. Population or business requirement added to a community must find the telephone ready, waiting.

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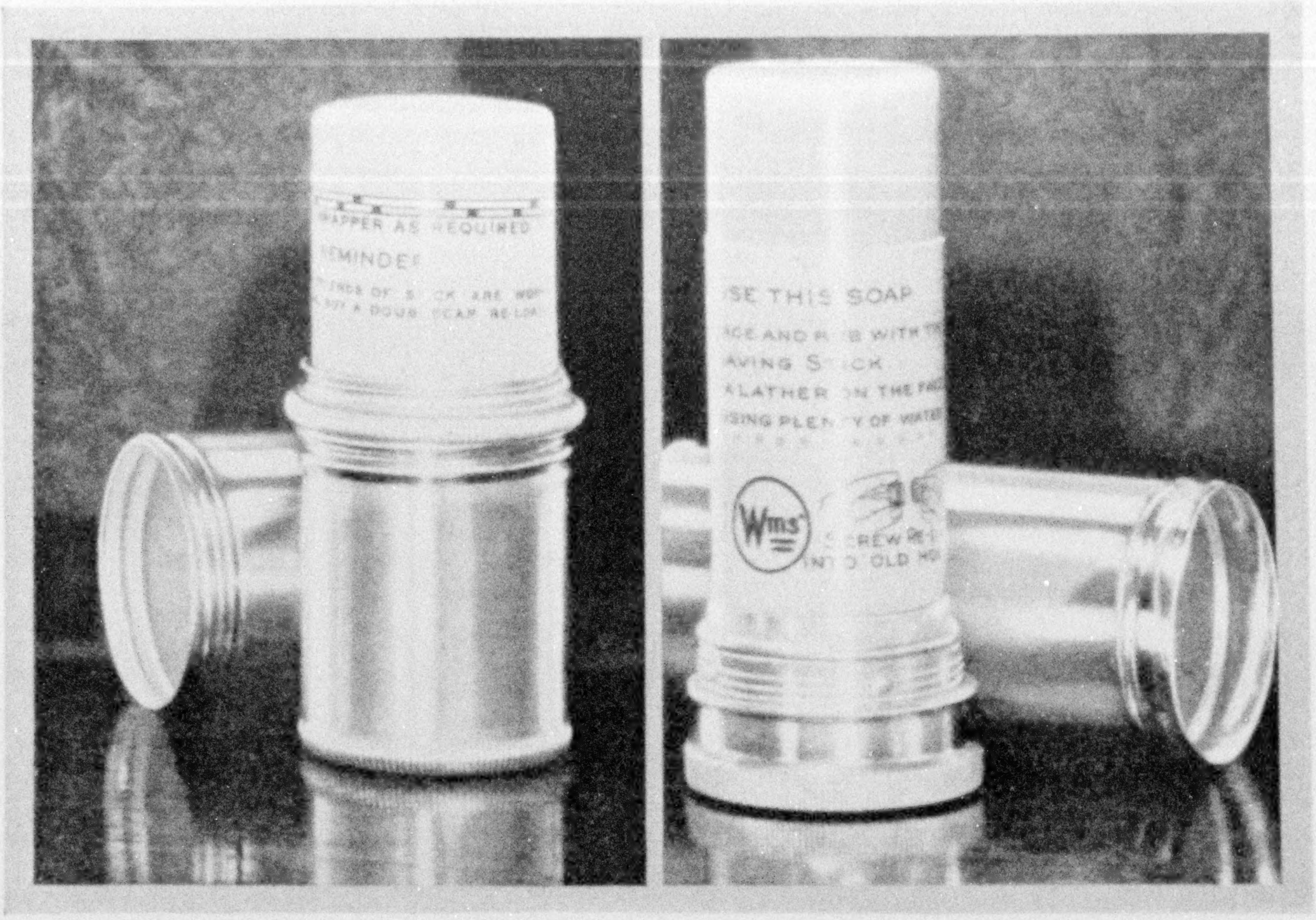

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Here's a shaving stick that gives you a firm full-hand hold even when the stick is worn down until it is merely a thin wafer

HOLDER TOP
Like Doublecap the stick is held by a threaded metal ring—no chance of its working loose. There are Reloads for both Williams sticks.

Two holders but one lather—Williams!

A MAN who tells us he has used nothing but Williams Stick for 28 years says: "Why harp on holders? Don't you realize that every man who ever used a Williams stick once would insist on Williams even if your soap had no holder?"

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All right then, take your choice—Doublecap or Holder Top. Both contain the same full length stick—both give the same famous Williams lather. Perfected by three generations of shaving soap specialists, there is nothing else like it. Quick, thick, lasting. It bulks. It holds moisture. It softens the beard—speedily, thoroughly. It makes the skin flexible. It leaves the face feeling like velvet.

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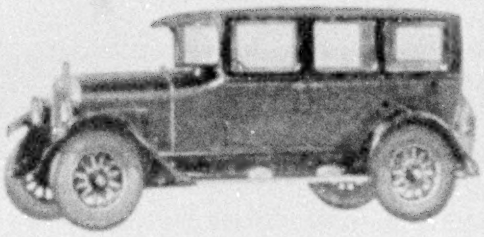

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Thus the great Maxwell organization and its wonderful plants have brought within the buying-ability of new thousands, unequaled pick-up and all the speed at which a man will care to drive—long life and a distinguished exterior which wins sincere admiration.

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MAXWELL

Balloon tires, natural wood wheels, stop-light, transmission lock, Duco finish *standard* on all Maxwell models. Shrouded visor integral with roof, heater, standard on all closed models.

There are Maxwell dealers everywhere. All are in position to extend the convenience of time-payments. Ask about Maxwell's attractive plan.

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A flexible shoe for your flexible foot

Like the foot, the Cantilever Shoe is flexible from toe to heel.

Your foot can exercise and strengthen in the Cantilever, as Nature intends it should.

The arch of the shoe fits the undercurve of any foot snugly with all the nicety of a "custom fit" and gives restful support without restricting the foot muscles.

The natural lines, the snug heel, the gracefully rounded toe, and the ankle-hugging sides are other refinements that make the Cantilever fit so well.

Moderate height heels are scientifically placed to distribute the body weight evenly over the foot.

Feet that are free in flexible Cantilevers know REAL comfort.

Have they still the spring of youth?

WATCH your step the next time you walk. Do your feet carry you along buoyantly, as they should? Or, do you tire easily?

If you find little real pleasure in walking, what Miss D. B. C., of Marquette, Michigan, has to say will interest you. She writes, "I have been wearing Cantilever Shoes for the past few weeks and have been 'walking on air' and gaining in speed! Cantilevers have strengthened my arch and I have not been since troubled with that painful cramping of the toes and foot."

Without good feet, you cannot keep health or youth. Wrinkles, crows' feet, a tired, unbecoming expression, are often due to shoe-bound feet. As your physician will tell you, your bodily health is affected if your feet are weak and cramped.

Give your feet comfort and freedom in flexible, naturally shaped shoes. You will then know better health and a keener pleasure for life—which is youth.

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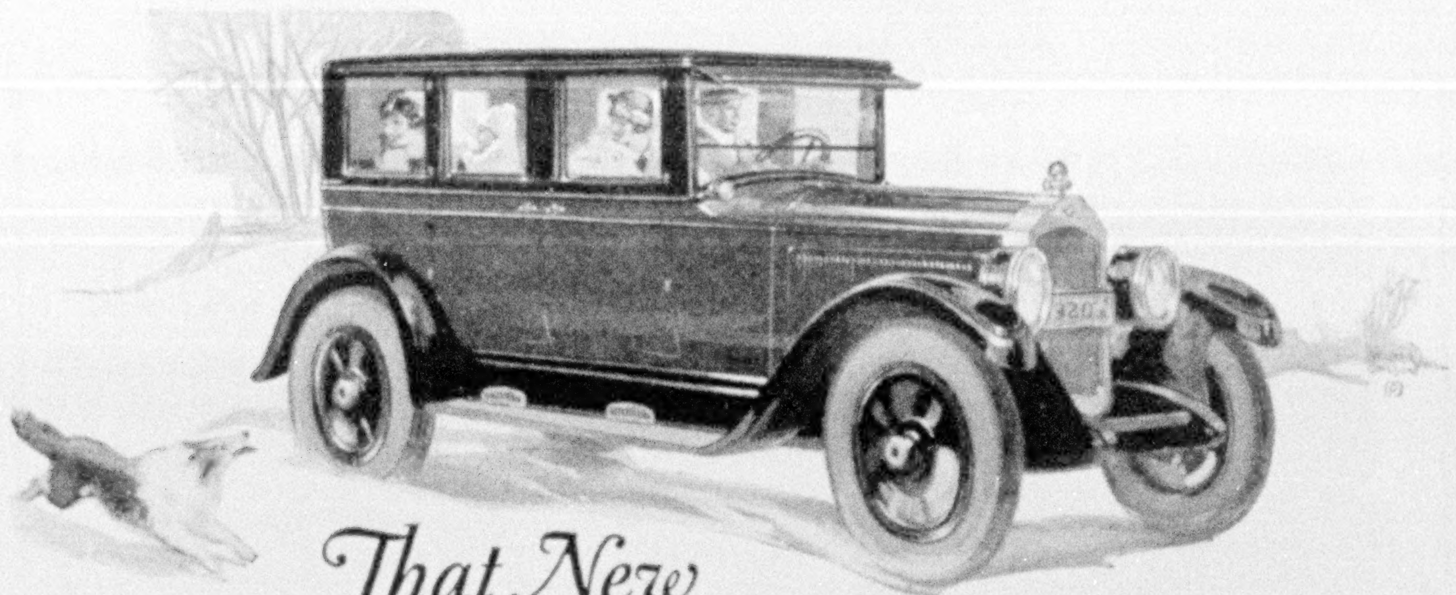

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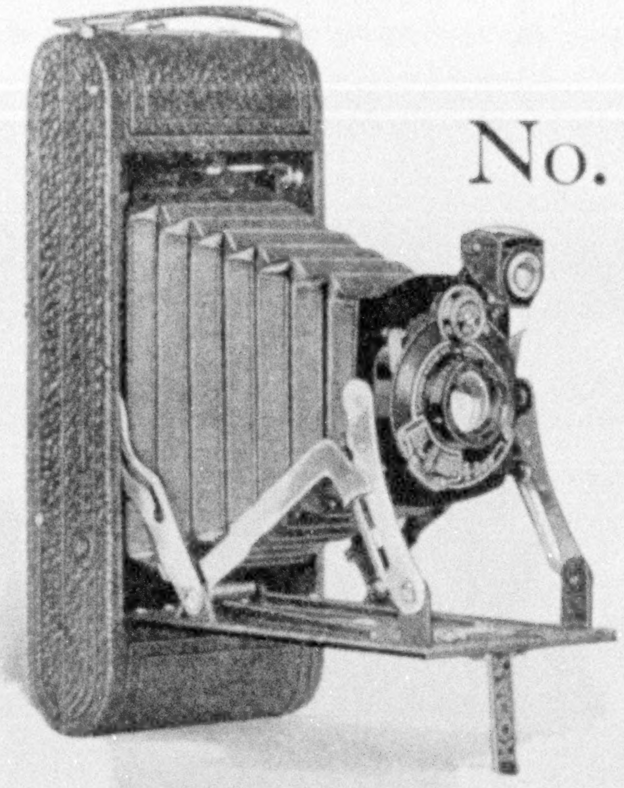

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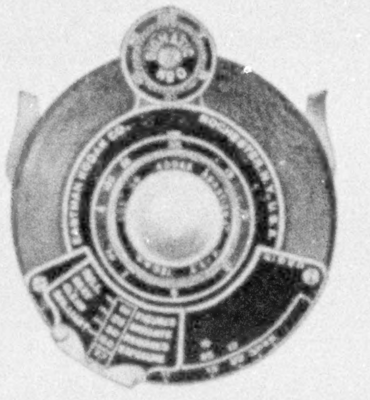

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Kodak Anastigmat *f*.7.7—for sharpness, peer of any lens in the world—means keen, sparkling negatives. And a fingertip turn of the lens mounting sets the focus for any indicated distance, beginning at 6 feet.

Mechanically, this camera is unique. With one motion the bed drops down, the front pops out, ready for the sudden chance.

1A Pocket Kodak, Series II, is a convenient, capable camera, making pictures of a size and quality that you'll like.

All Kodaks are Autographic

Eastman Kodak Company, Rochester, N. Y., *The Kodak City*

FREE to Mothers—10-Day Tube
Mail the Coupon

Look, mother, for film on your child's teeth

That's often a danger sign. If the dentifrice you now use doesn't combat it successfully, it's inadequate. How to combat it without harmful grit—*the new way in child's tooth care specialists recommend.*

FOREMOST dental authorities now advise a new way in caring for a child's teeth. A way different in formula, action and effect from any other method.

As a nation-wide hygienic movement, a 10-day test is offered mothers free. You are urged to make it. To see what modern science is doing for the better protection of children's teeth and health. Simply use the coupon.

What film indicates. Why it must be fought several times daily

Look at your child's teeth. If cloudy, dull, discolored, there's a film. And that film is often a danger sign. The child can feel it by running his tongue across his teeth.

Ordinary tooth pastes won't combat it successfully. Try the one you use now. See if the film does not still remain. To fight it constantly is essential to tooth health and general health. The teeth must be clean—any children's doctor, any dentist will tell you this.

* * * *

Film is a viscous coat that clings to teeth, gets into crevices and stays. It makes pearly teeth ugly, discolored—dingy. Many a naturally pretty child is handicapped in this way.

Film also holds food substance which ferments and forms acid. It holds the acid in contact with the teeth to cause decay. Germs by the millions breed in it. They, with tartar, are the chief cause of pyorrhea.

THAT fifty per cent—half the total—of our twenty-four million school children have tooth infections and decay which court the so-called communicable diseases and even mental deficiencies, is the amazing statement of world's hygienic authorities.

Where correct oral hygiene and dental care are practiced, children have shown amazing improvement in health, mental activity and immunity to disease.

This tells the most recent and widely accepted method of oral hygiene—the safe combating of the insidious, germ breeding film where most tooth troubles start.

As part of a nation-wide hygienic movement a 10-day test will be sent free to parents upon receipt of the coupon below.

Now a new way

Now modern science has found a safe way to combat film. Super-gritty substances are judged dangerous to the teeth. Soap and chalk methods are inadequate.

This new method, embodied in the tooth paste called Pepsodent, provides the scientifically proved combatants that leading dentists throughout the civilized world now advise. Their action is to curdle the film, then harmlessly to remove it.

To millions this new way has proved the folly of dull and dingy teeth. The folly of inviting tooth troubles and all that may accompany them, when scientific prevention is so simple.

Don't you think it worth while, in justice to your children, and in fairness to yourself, to try it for ten days? The test will cost you nothing. What it will do for your children, it will do for you, for every member of your family.

Start today

Use the coupon for a free 10-day tube.

1696

FREE Mail Coupon for 10-Day Tube to

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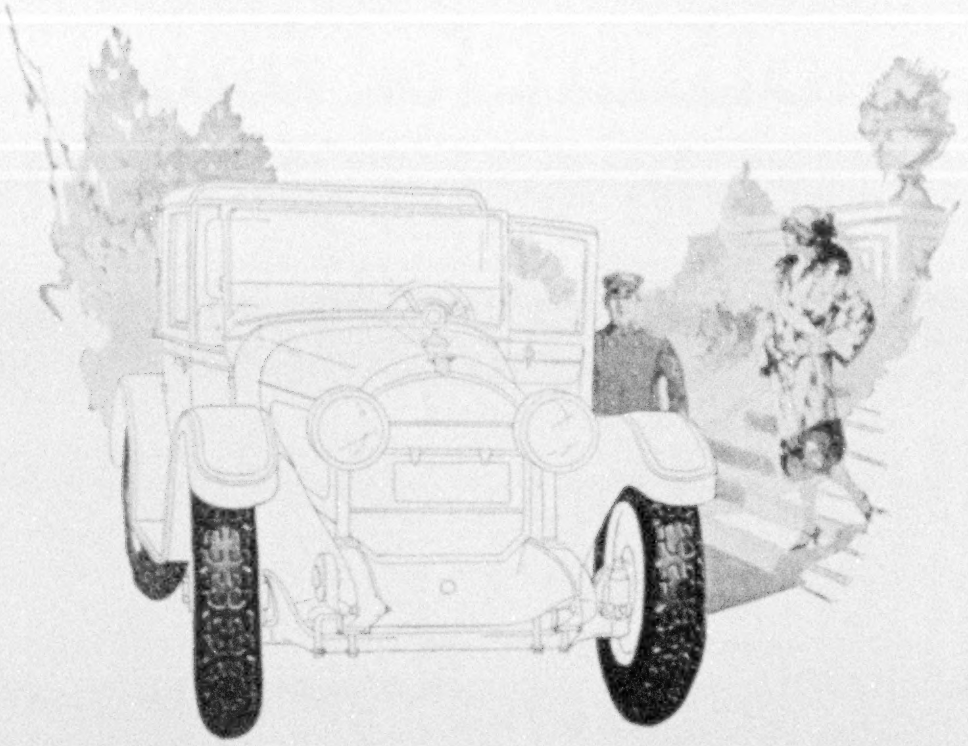
THE PEPSODENT COMPANY, Dept. 609, 1104 S. Wabash Ave., Chicago, Ill., U. S. A.

Send to:

Name ....

Address ....

Only one tube to a family.



Another Step Forward in Cord Tires

It was General's mastery of internal friction that enabled it to produce, five years ago, the first low-pressure tire ever placed on the market — the General Jumbo 30 x 3½ Cord with air pressure of 30 pounds. Just as today it has enabled General to produce the successful 6-ply Balloon Cord, to replace 4-ply Balloons on all except the smaller cars—combining all Balloon advantages with the right strength for the load, as well as reducing Balloon puncture risk 90%.

The Mark of Leading Tire Stores Everywhere

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The Best Essex Ever Built—$895

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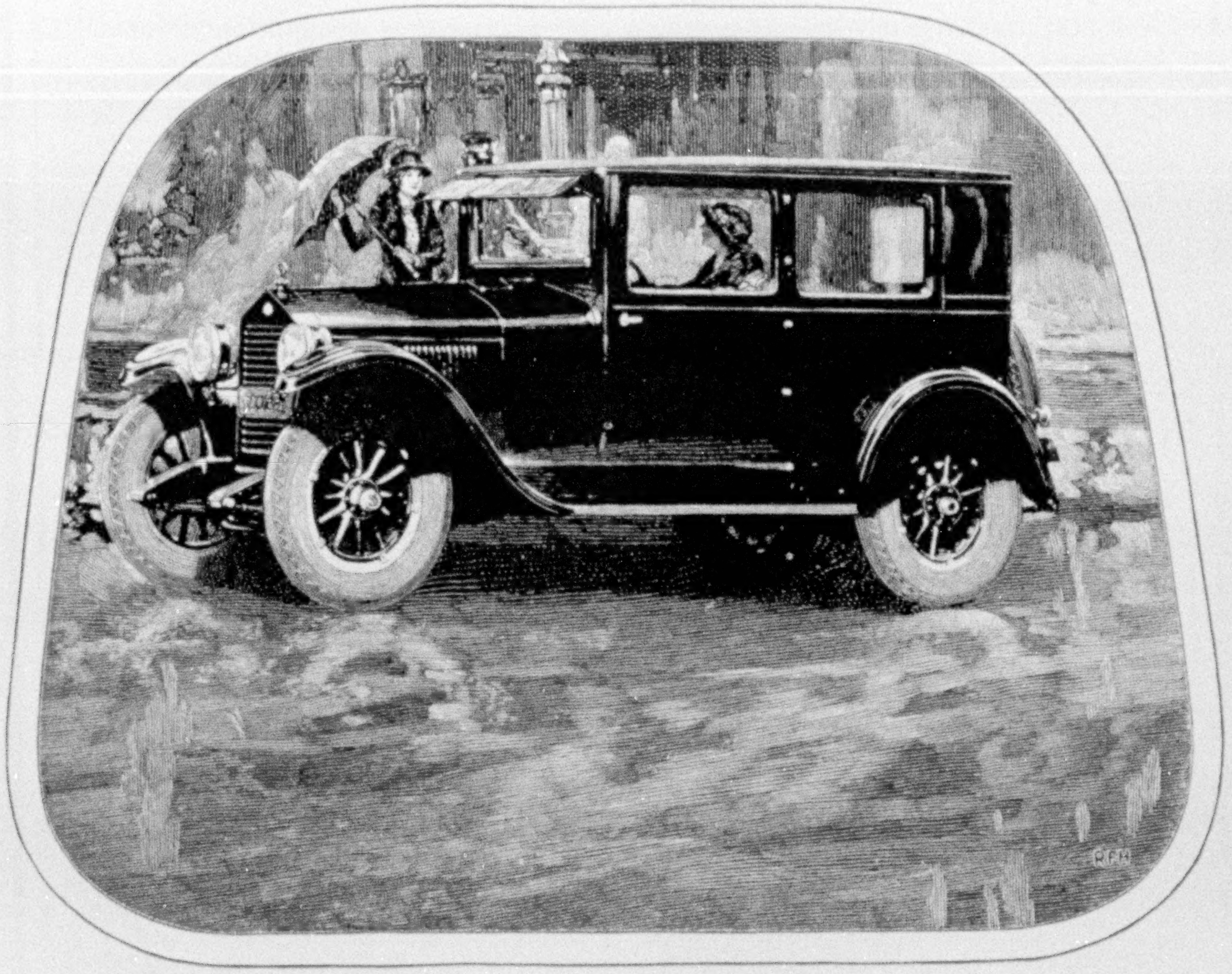


Its Greatest Values Cannot Be Copied

The Chassis is Patented

Price considered, Essex gives the utmost in transportation value. By all means learn the facts. Ask Essex owners. Take a ride. Note this smooth performance, not surpassed by any car. How simply it handles. How luxurious its riding ease. Then think of its price.

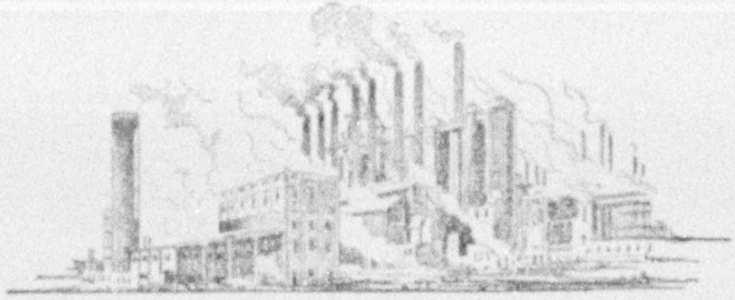
Two of every three Essex buyers come to it from those who formerly owned cars bought chiefly for their low first cost.

Essex has all the advantages of the famous and exclusive Hudson patents. In quality Hudson and Essex are alike.

It is the finest Essex ever built. Its cost is but little more than cars of the lowest price.

Essex Holds Its Own In Any Company—In Any Service

XUM



The Service of Sheet Steel to the Public

WITHIN the last two decades the American people have begun to learn the advantages of sheet steel. In every branch of industry, in agriculture, in transportation, in the home, sheets have proved their superior service and economy for a vast number of important uses.

Rightly applied, there is no more economical and durable roofing material. The advantages of Sheet Steel for many varied industrial applications are known to every engineer. In the modern public building, hospital, hotel, office, restaurant and home, their fire resistive qualities, strength with light weight, economy of space, sanitary cleanliness and ease of application make them invaluable. The ease of forming sheets and the development of machinery for that purpose have enabled the manufacturers of a great range of products to increase the efficiency of their commodities or to cheapen costs, or both.

In 1905, American mills produced less than one million tons of sheets. By January, 1924, the annual productive capacity had increased to nearly five million tons. Yet this 500 per cent increase in the use of sheets, large though it is, represents only a small part of their potential usefulness.

There still remain wide fields in which there is as yet little realization of the better and more economical service which Sheet Steel can give.

But the public in general does not know that sheets are differently made for different uses and that all sheets are not alike. It does not know which gauges will give the best service for certain uses. And so consumers sometimes buy sheets which are not of the right quality or gauge for the purpose intended.

To inform the public regarding the superior service of Sheet Steel for many uses, the different kinds of sheets, and the right sheets to employ for specific purposes and how to be sure of getting them, the Sheet Steel Trade Extension Committee has undertaken a campaign of education in which this is the first announcement to the general public.

You will probably be interested in the booklet, "The Service of Sheet Steel to the Public." It will be sent free, postpaid, on request.

SHEET STEEL
TRADE EXTENSION COMMITTEE
715 OLIVER BUILDING
PITTSBURGH PENNSYLVANIA

God Bless Father—and Keep Him Safe

—is a prayer that goes up from a million small lips this night. Fathers do well who are worthy of its tribute.

It shows so clearly in the back of the small mind the realization that Father will feed us, clothe us, shelter us. It is putting into words the wife's smile for her husband when he comes home after the long day—the children's shout of joy as the familiar footstep sounds on the porch, and the key clicks in the lock.

All credit to the Fathers who deserve it. Many of them go even beyond providing against the dangers of today and tomorrow. Some of them even say "I will make sure that *every month* of their lives, they shall receive the means upon which they may live in comfort and safety."

What Are Prudential Monthly Income Policies?

While you are young you can provide for your old age. While you live you can provide for those who depend upon you and who would suffer when you are no longer with them. The Prudential Monthly Income Policy pays a monthly income for any selected period of years or for a whole lifetime, as steady and sure as the Rock of Gibraltar. Ask any Prudential agent or write us.

The PRUDENTIAL

INSURANCE COMPANY OF AMERICA

Edward D. Duffield, President *Home Office, Newark, New Jersey*

XUM

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SHE'S your daughter—and perhaps you hate to think of her having to work for a living.

But this sort of thing does happen in very nice families—and too often the girl is utterly unprepared for any well-paid occupation. So she takes a poorly-paid job as sales girl, waitress or clerk.

* * * *

It's different when there is a Corona in the home. A child who has learned to use Corona Four, with its standard office keyboard, can operate any office machine—and you've provided her with the best kind of an insurance policy against the day when she may be forced to support herself.

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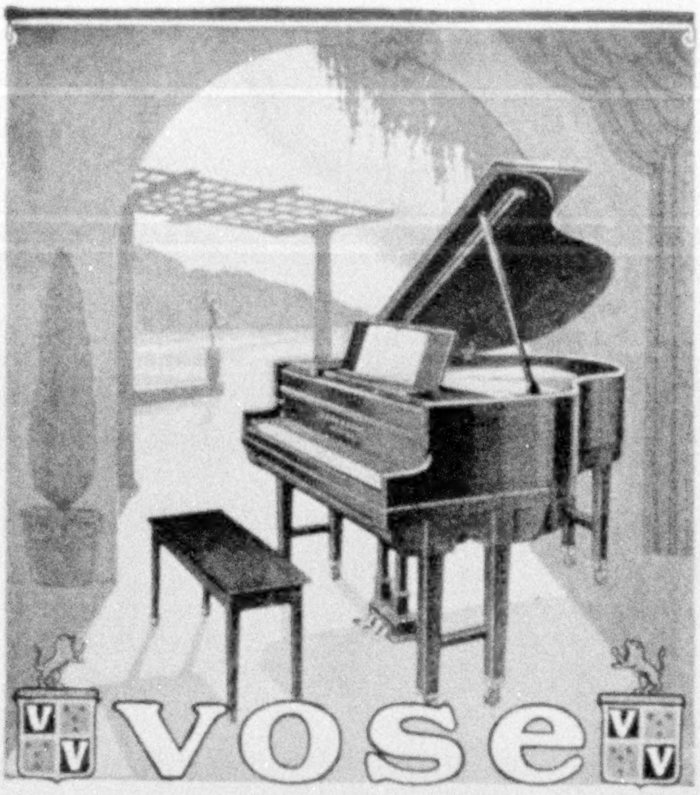

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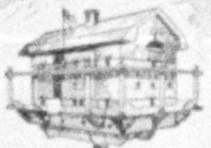

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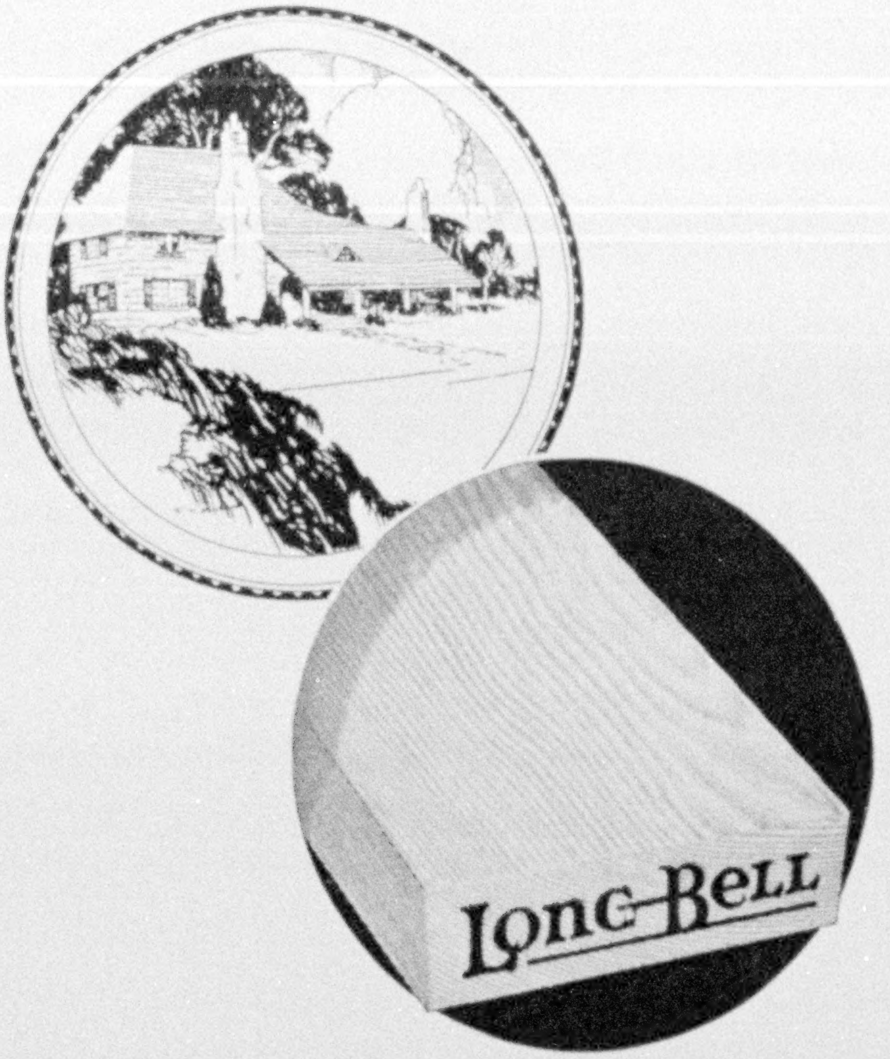
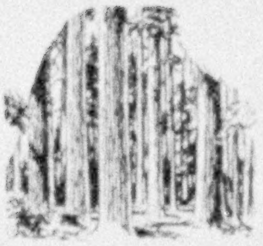


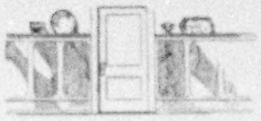


DOUGLAS FIR —with the Long-Bell Trade-Mark

Douglas Fir lumber and timbers are being produced in the Long-Bell manufacturing plants at Longview Washington. The same high standards of production governing Long-Bell manufacture of Southern Pine California White Pine, Southern Hardwoods, Oak Flooring and other Long-Bell trade-marked lumber products, are being carried out in the manufacture of fir. Buyers of Fir lumber and timbers will find maximum value in material bearing the Long-Bell trade-mark on the end of the piece.

Beautiful Oak Floors

Floor value in the modern small home is important. Oak flooring is popular because of its beauty. *Carefully manufactured* oak flooring, however must be used if the builder desires permanently satisfactory floors. Long-Bell trade-marked Oak Flooring is carefully manufactured. It is economical to lay and finish and gives beauty and durability to the home. A valuable booklet, "The Perfect Floor," will be mailed on request.



White Pine Doors

Long-Bell all-white-pine doors made throughout of California White Pine, give universal satisfaction. They are beautiful in appearance—take any finish—do not check or split—and cost less to fit mortise and hang. Ask your lumber dealer.

Timbers for Heavy Construction

All Long-Bell timbers are made on special order. From the selection of the tree to the finished product, every attention in manufacture is centered on the purpose for which the timber is to be used. For many years Long-Bell trade-marked timbers have been used in railroad and industrial construction. Long experience enables us to supply timbers of dependable quality, an important consideration for every buyer.

Just a Little Home

—but build it well!

A little home is planned always with the hope of having the utmost comfort, convenience and coziness—three essentials in the modern small home.

Quite as essential, when a family's investment must be protected, is the *permanence* of these things in a home.

Today, as never before, home builders are asking more of their home investment than mere *first comfort*. They know a home can be so built that it will preserve through many years the comfort and coziness of the first year.

A home must be built well to withstand Time and preserve investment value. Good construction and good lumber do much to build permanence into the home.

From the felling of a tree to the finished product, Long-Bell manufacture is intent on the one aim of putting maximum building value into lumber. Every possible safeguard in production assures this value.

Lumber so carefully manufactured has the trade-mark "Long-Bell" on the end of the piece, not only as a means of identification, but as a signature of one of the world's largest lumber manufacturers on a product it has *made for the satisfaction of the user*.

Your lumber dealer knows the value of Long-Bell lumber products. Consult with him about your plans and have the benefit of his counsel in the important matter of selecting the quality of lumber that will build permanence into *your* new home.

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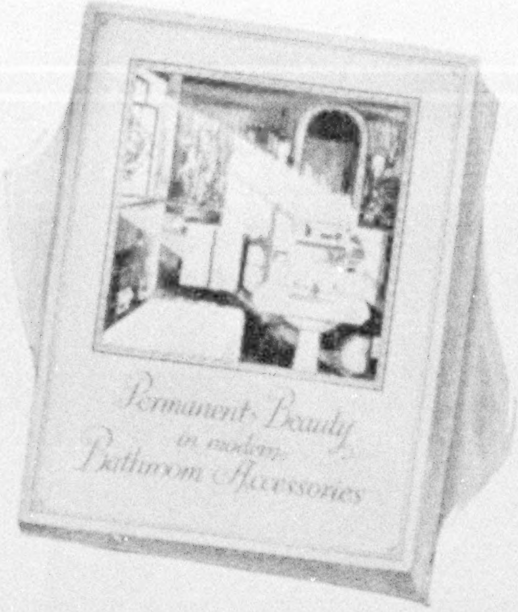

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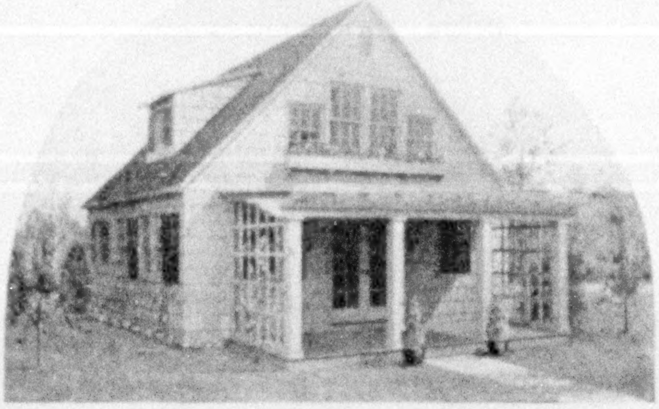

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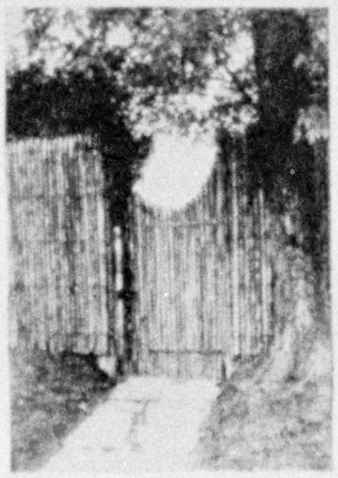

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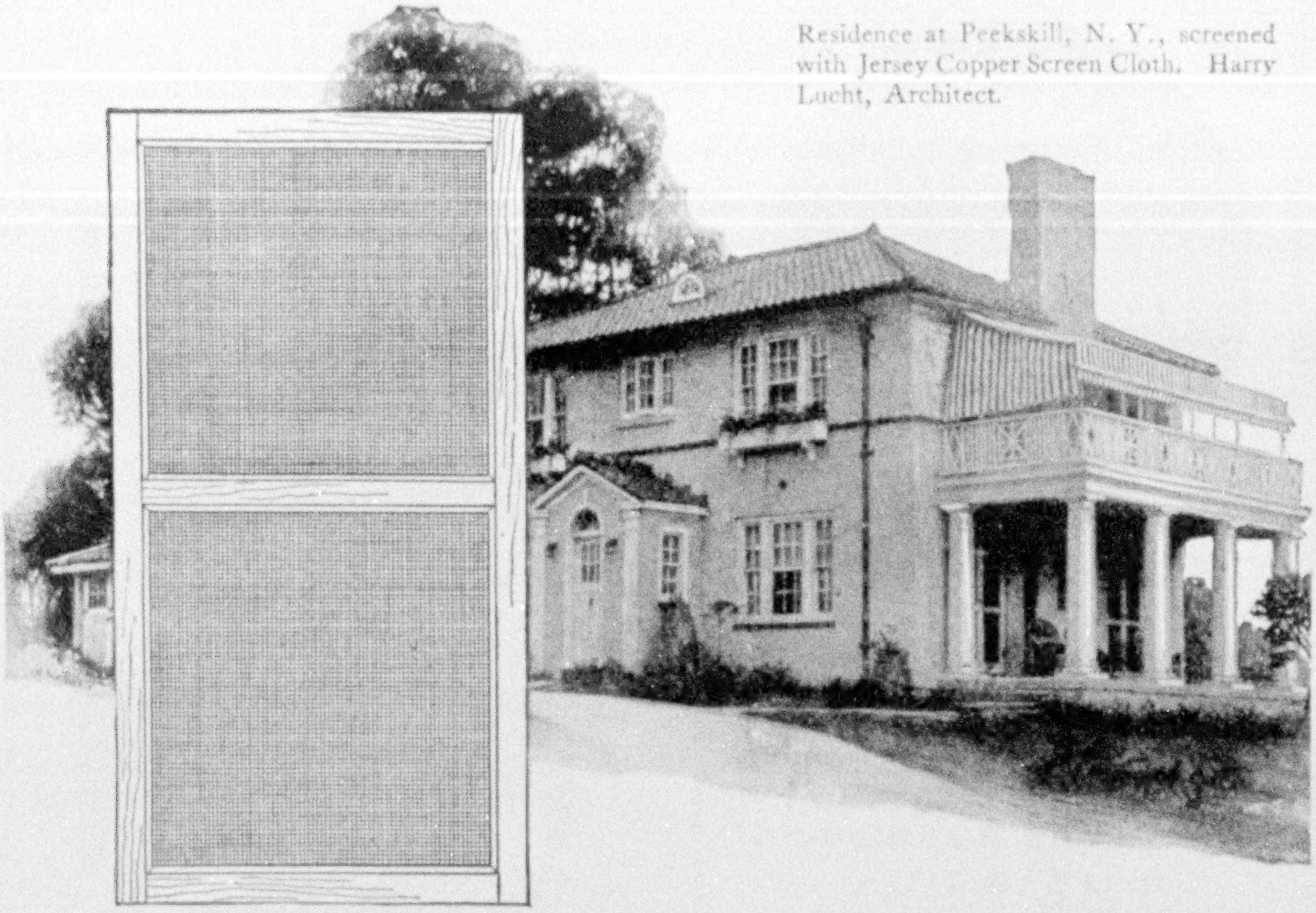

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In our files is an infinite amount of proof, in the form of testimonials from satisfied users, as to the unusual durability of Jersey. Talk to your hardware merchant or custom-made screen manufacturer regarding Jersey Copper Screen Cloth. If he cannot supply you write us. We will supply the name of a distributor near you and send you samples and descriptive matter.

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All Grades of Wire Cloth Made of All Kinds of Wire
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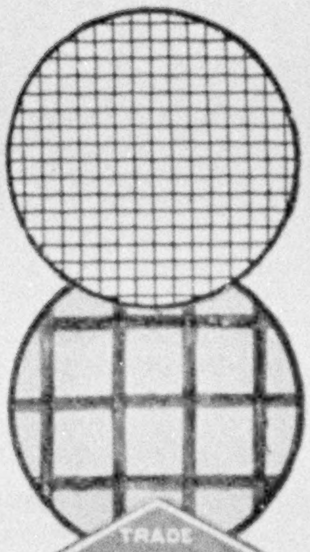
Trenton New Jersey



TRADE JERSEY MARK

In the upper circle is shown an unretouched photograph, actual size, of Copper Screen Cloth (heavy grade) made by The New Jersey Wire Cloth Company, which has been subjected to the action of salt air for more than twelve years.

In the circle below is the same Copper Screen Cloth enlarged 4 diameters.

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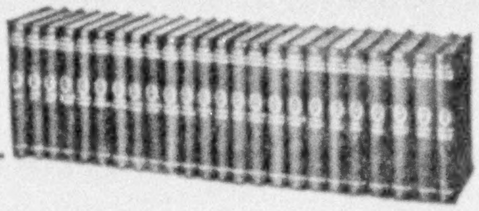

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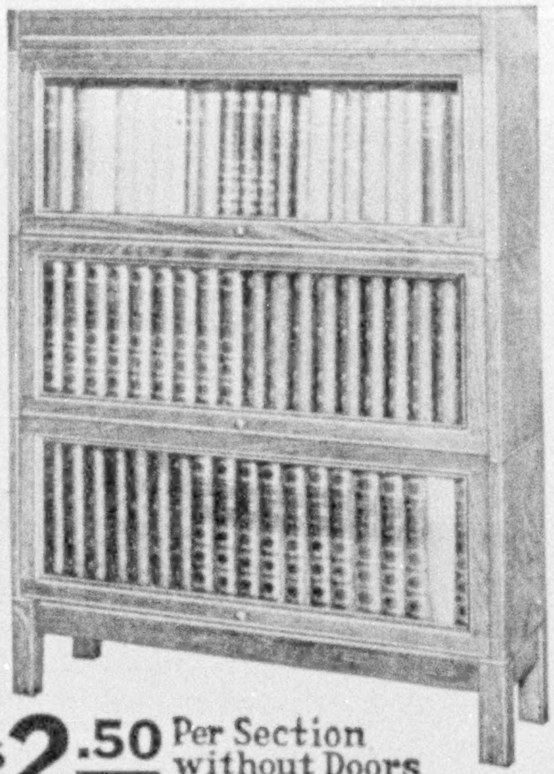

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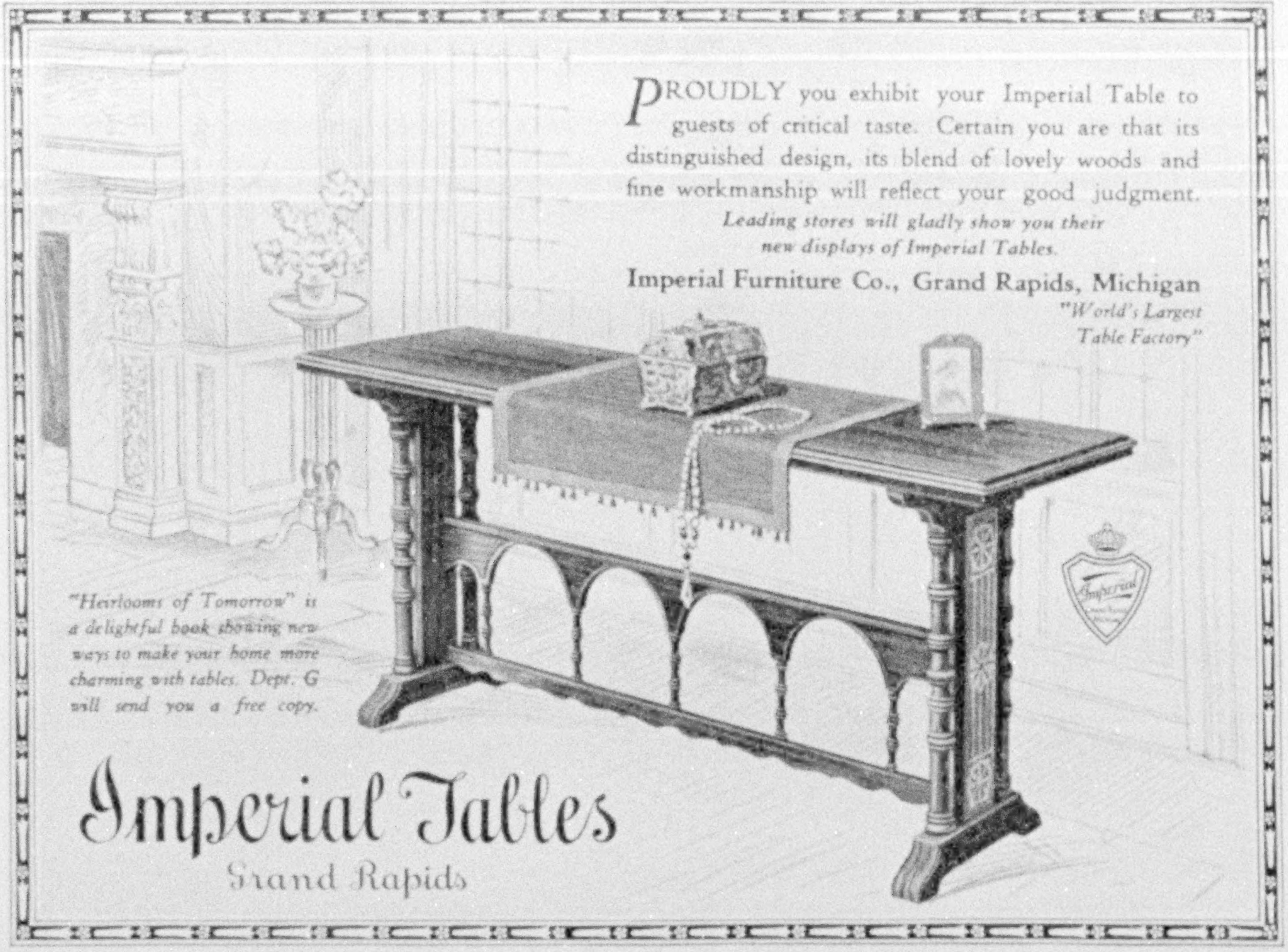

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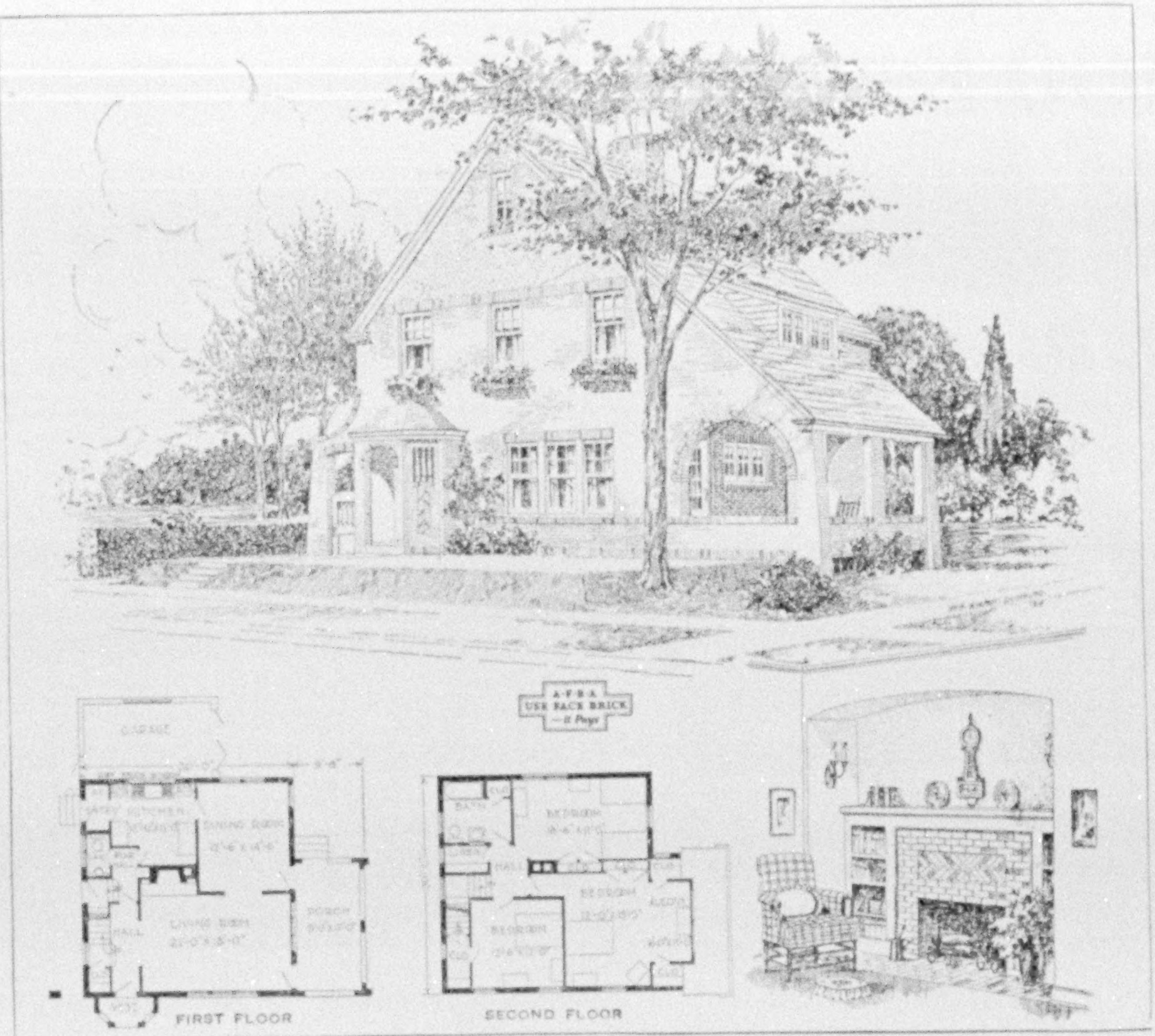

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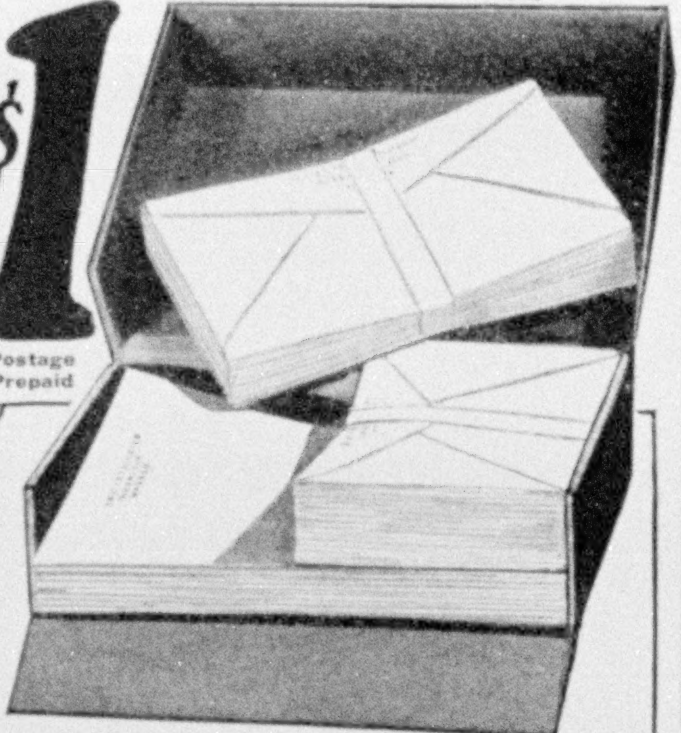

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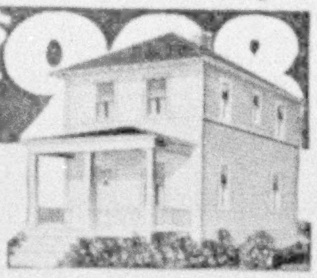

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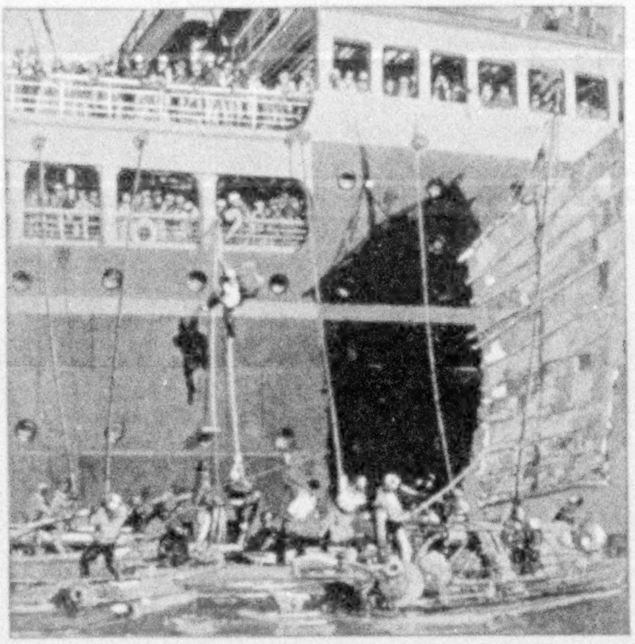

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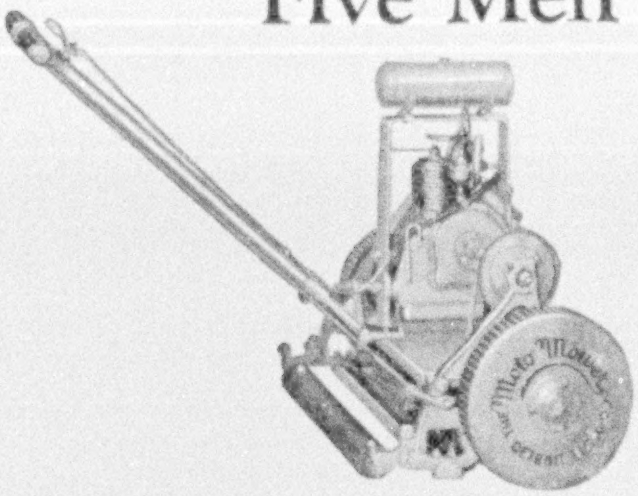

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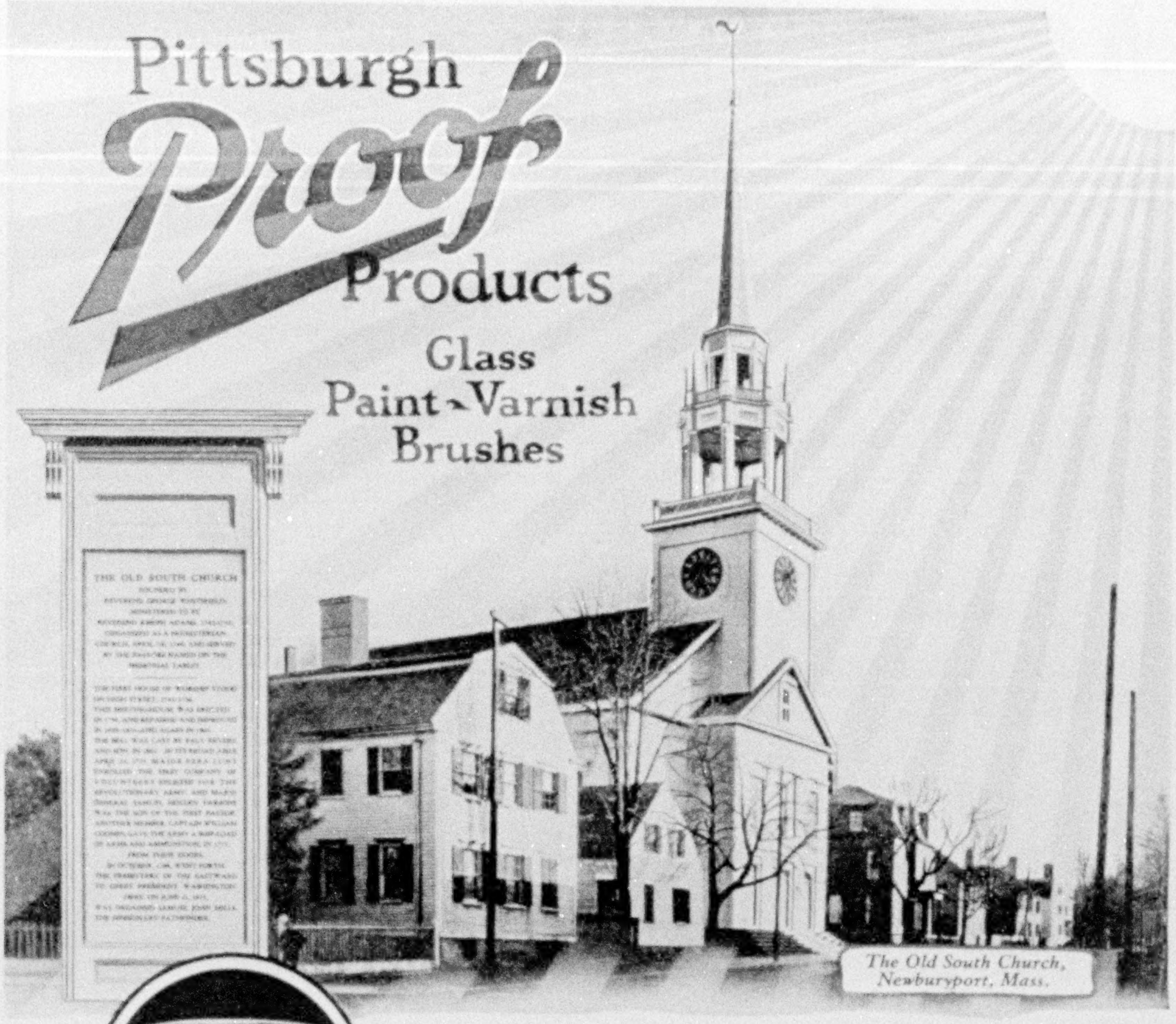

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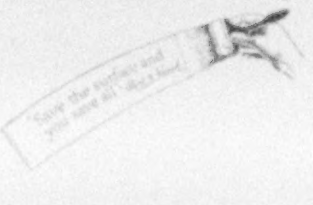

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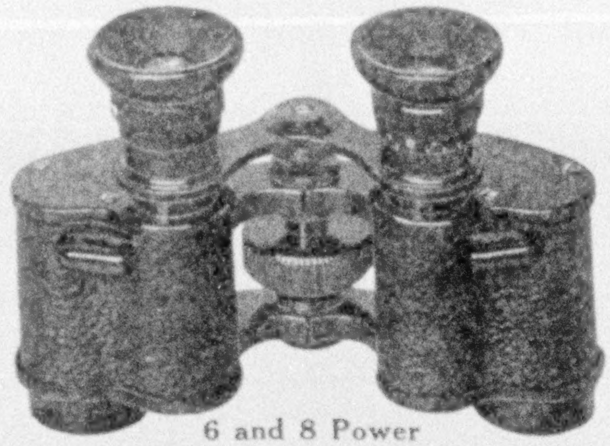

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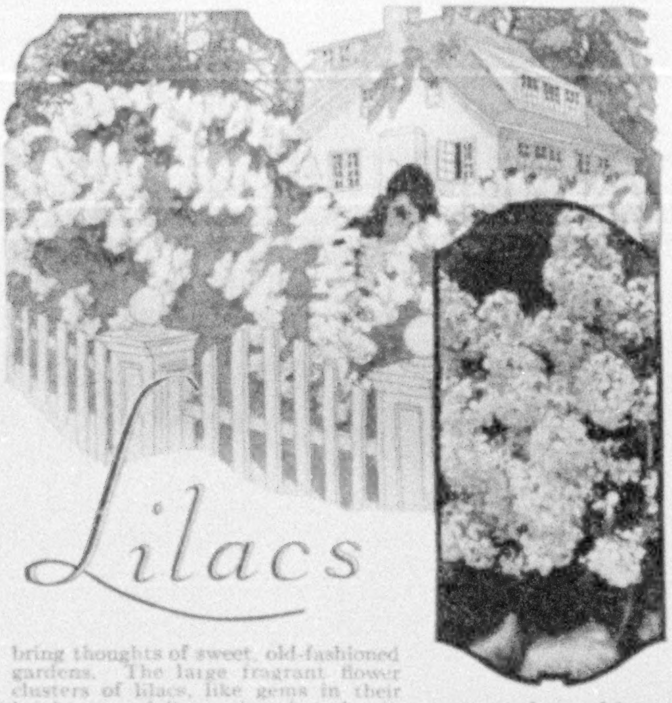

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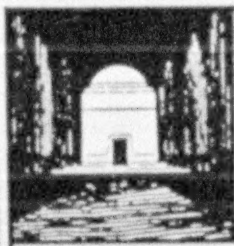

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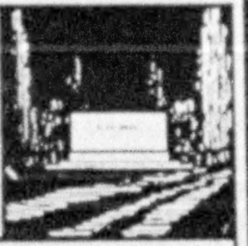

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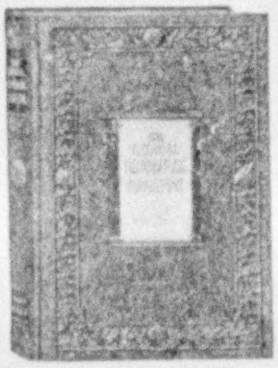

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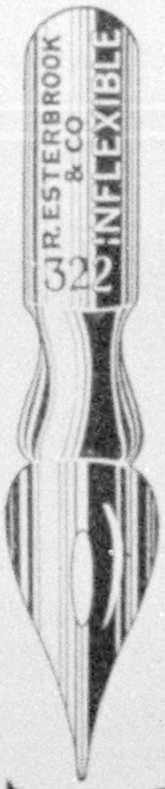

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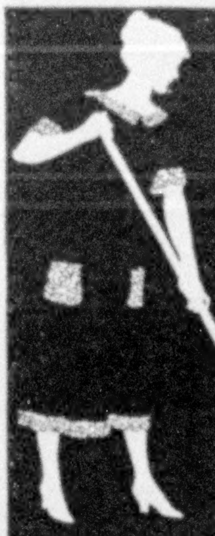

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Look for the name WHITING - ADAMS on every brush you buy. *Whiting* and *Adams* have been household buy-words for brushes for over 116 years — always standing for service and satisfaction.

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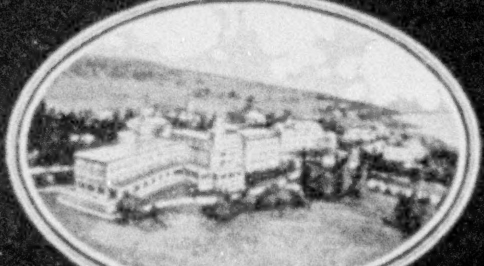
BRUSHES

JOHN L. WHITING - J. J. ADAMS CO., Boston, U. S. A.
Brush Manufacturers for Over 116 Years
and the Largest in the World



THE GLEN SPRINGS

WATKINS GLEN, N.Y.
ON SENECA LAKE

Open All Year   Wm. E. Leffingwell, Pres.

A Health Resort and Hotel with complete facilities for the treatment of heart, circulatory, digestive and nervous disorders. Valuable mineral springs—highly radio-active. Baths under specialized medical direction. Illustrated booklets on request.

New—different—beautiful

"Star Guide to Good Roses"

lists America's 100 best roses—first time such a list was ever published. 100 pages, 18 in full color. The short cut to rose selection and rose satisfaction. New "Star Guide" describes roses as never before. It's *free*. Write today!

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★ *Formerly Conard & Jones Co.* ★
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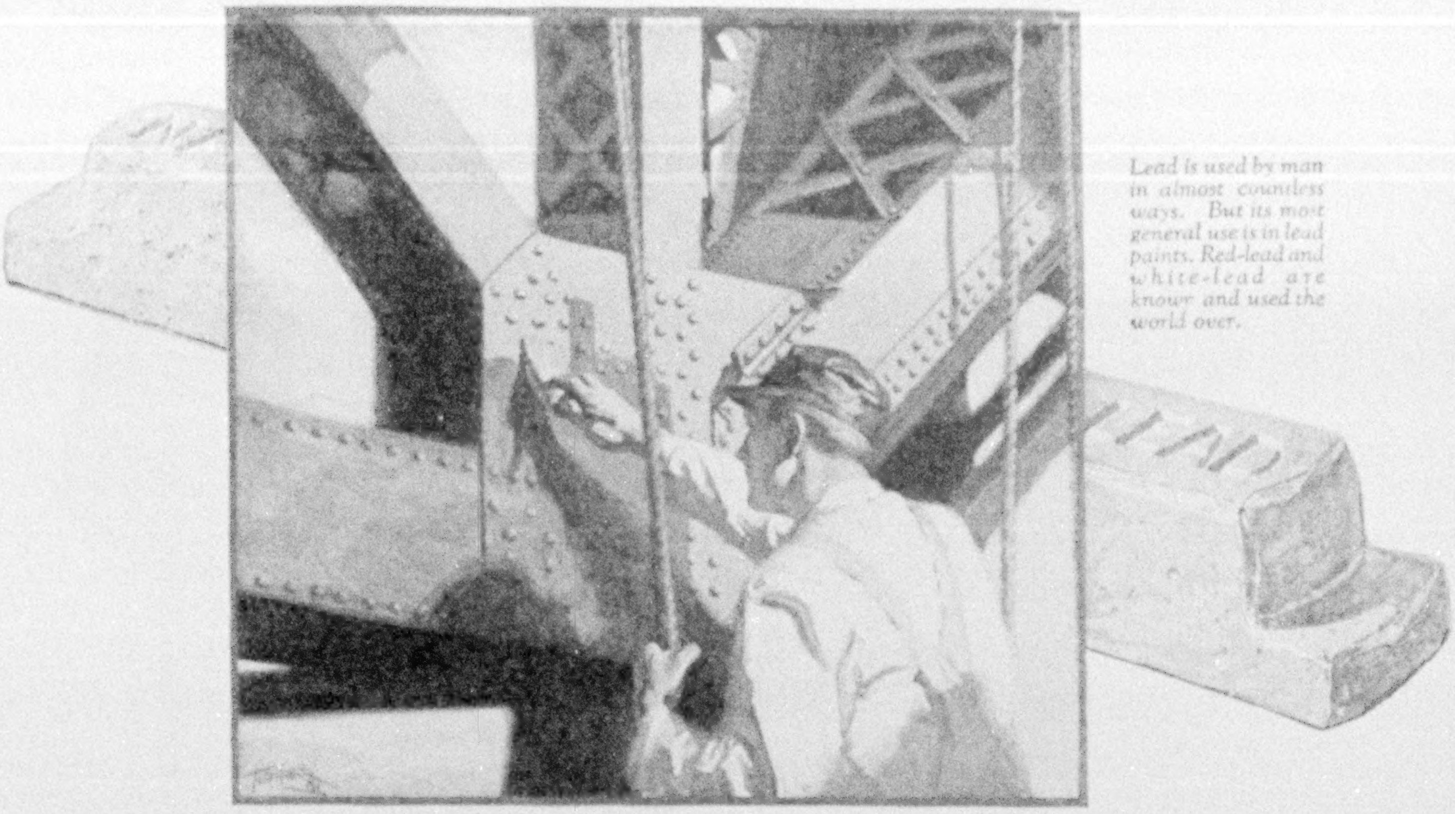


Lead is used by man in almost countless ways. But its most general use is in lead paints. Red-lead and white-lead are known and used the world over.

Red-lead helps man win the greatest war of all time

THIS war is between man and Nature. What man builds, the forces of Nature try to destroy. Nature is everlastingly striving to return all materials to their original and most stable form. So it has been since the beginning of time.

Man uses in his structures, among other materials, the strongest metal he has—steel. Opposed to it is one of Nature's strongest elements—moisture-laden air. The air attacks this metal which man has won from Nature and tries, by what is known as rusting, to draw it back to its original state. If the metal is left to face the attack alone, it soon weakens. It crumbles—is destroyed.

But few steel structures are permitted to rust rapidly away. Man thwarts Nature by protecting his steel with an armor of lead paint. With pure red-lead such as Dutch Boy red-lead he makes a paint covering through which air and moisture do not penetrate. The life of steel is prolonged indefinitely with this armor of paint derived from the metal lead.

Dutch Boy red-lead has stood all tests for durability. It makes a hard, tenacious film that gives full and economical protection to the metal surfaces it covers. It comes in the natural red-lead color and can be shaded to browns, greens, and black.

We shall be pleased to send you "The Handy Book of Painting," which has a special section devoted to the protection of metal surfaces.

Other Dutch Boy Products

In the famous Dutch Boy series of products, besides red-lead, there are white-lead, flatting oil, solder, linseed oil, and babbitt metals.

National Lead Company, in addition, makes lead products for practically every purpose to which lead can be put in art, industry, and daily life. Among the products are litharge, sheet lead, lead bars, lead cames, lead pipe and lead tubing.

If you desire specific information about any of these or other uses of lead, or on any special painting problem, write to our nearest branch.

NATIONAL LEAD COMPANY

New York, 111 Broadway; Boston, 131 State Street; Buffalo, 116 Oak Street; Chicago, 900 West 18th Street; Cincinnati, 659 Freeman Avenue; Cleveland, 820 West Superior Avenue; St. Louis, 722 Chestnut Street; San Francisco, 485 California Street; Pittsburgh, National Lead & Oil Co. of Pa., 316 Fourth Avenue; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut Street.

From the House of Banister

The RENFREW

These men ... in the higher places

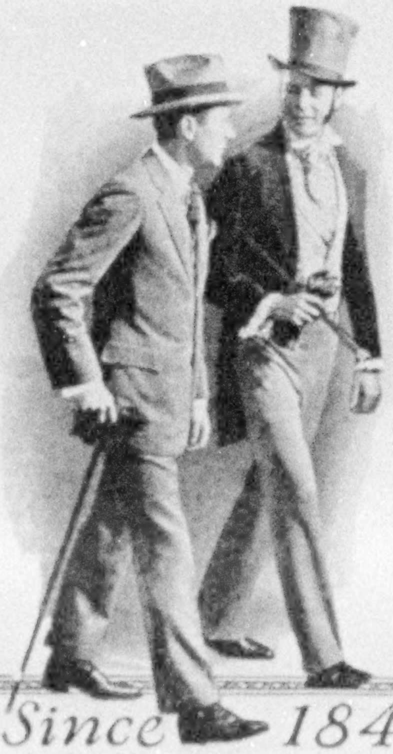
YOU find them—these men who wear Banister Shoes—in the higher walks of life. Not that the shoes, of themselves, carry them there!

But men who do things, who wrest from life the best it has to offer, choose for their own comfort and appearance what their critical judgment tells them is right for them.

It has been so for eighty years. Today it is true. It will be so in the years of tomorrows.

Are you acquainted with a Banister dealer? If not, it will pay you to write for the names of those nearest you.

JAMES A. BANISTER CO.,
NEWARK, NEW JERSEY.

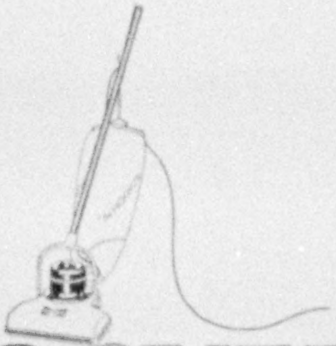


BANISTER
Shoes

Since 1845 the Choice of Gentlemen

"Yes, rugs must be beaten regularly"

DIRT—*dangerous, destructive dirt!*—is being found in rugs that were thought to be clean. A simple test—which you, too, can make* . . . is proving that *rugs must be beaten* if the embedded sharp-edged dirt which cuts rug nap is to be *thoroughly* removed. As a result, The Hoover is the largest selling electric cleaner! For The Hoover BEATS . . . keeping rugs immaculate. The Hoover sweeps, easily and quickly. The Hoover Air-cleans, even to dusting, *dustlessly*, its remarkable new attachments serving your every need. Yes, The Hoover is the *complete home-cleaning servant.* And your Authorized Hoover Dealer will deliver one, complete with attachments, for only $6.25 down.



The HOOVER

It BEATS ··· as it Sweeps as it Cleans

**To prove rugs need beating:*

Turn over a corner of a rug; with the handle of an ordinary table-knife, or something of equal weight, give the under or warp side 15 to 25 sharp *taps* and watch the dirt dance out from the nap depths onto a piece of paper. Feel the destructive character of this grit. *This is the dirt only beating will dislodge.* Correct use of The Hoover causes this embedded dirt to be *vibrated* to the surface by the rapid gentle *tapping* of the Hoover brush, as powerful suction lifts the rug from the floor and draws all the dirt into the dust-tight bag.

THE HOOVER COMPANY, NORTH CANTON, OHIO

The oldest and largest maker of electric cleaners · The Hoover is also made in Canada, at Hamilton, Ontario

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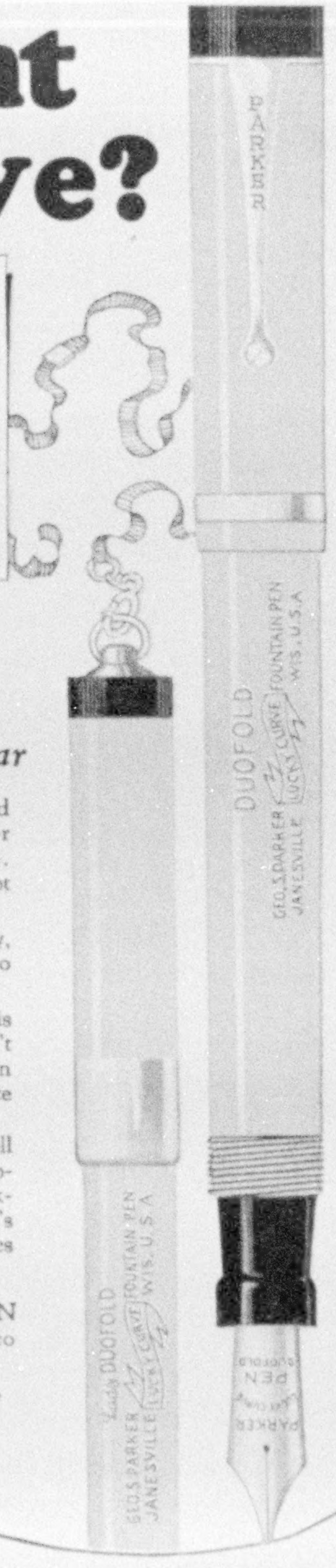
WASHINGTON, D. C.

XUM

RIVALS THE BEAUTY OF THE SCARLET TANAGER

Which Point Will You Have?

1—Extra fine—like this
2—Fine—like this
3—Medium like this
4—Broad—like this
5 Stub—like this



You can get all five degrees in the classic Duofold Pens

And All Points Guaranteed for 25-Years' Wear

FOR what kind of writing do you use a pen? How do you hold it? And what style of writing is entirely natural to your hand?

Close figure work or fine memoranda, for example, call for a fine or an extra-fine point. But the medium point, the broad, or the stub—these give one's penmanship a personality and character that make mighty valuable impressions in a letter or a signature.

These are reasons why, in the Classic Duofold Pens, Geo. S. Parker gives the world the whole five degrees of points that the five degrees of writing require.

Points you can lend without a tremor, for no style of writing can distort them. Points that are tipped with super-smooth Iridium, for which we pay a premium of 200%. Points that we guarantee, if not mistreated, for 25 years' WEAR.

And every point set in a shapely, hand-balanced barrel that feels so inspiring you hate to lay it down.

You can buy cheaper pens, but is the saving worth it? For you can't compete with the world on even terms if your pen can't keep pace with the Duofold.

Any good pen counter will sell you this beauty on 30 days' approval. Flashing black, or black-tipped lacquer-red, the color that's handsomer than gold and makes this a hard pen to mislay.

THE PARKER PEN CO., JANESVILLE, WISCONSIN

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Over-size, $4

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THE PARKER PEN CO., LIMITED, 2 AND 3 NORFOLK ST., STRAND, LONDON, ENGLAND

Red and Black Color Combination Reg. Trade Mark U. S. Pat. Office

Parker LUCKY CURVE Duofold
With The 25 Year Point

OVER-SIZE $7

Slender Lady Duofold $5
Ribbon $1 Extra

Over-size Duofold $7
Duofold Jr. Same except for size $5